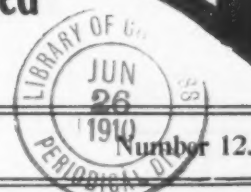


Rock Products

DEVOTED TO
Concrete and Manufactured
Building Materials

Volume IX.

CHICAGO, ILL, JUNE 22, 1910.



CAROLINA PORTLAND CEMENT COMPANY

We are the largest distributors of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere. Also Southern agents for the "Dehydrated" waterproofing material. "Universal," "Acme" and "Electroid" Brands Ready Roofing. Get our prices.

Charleston, S. C. Birmingham, Ala. Atlanta, Ga. New Orleans, La

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DEXTER Portland Cement
THE NEW STANDARD

Sole Agents: **SAMUEL R. FRENCH & CO.** BOSTON

UNION MINING COMPANY

Manufacturers of the Celebrated

DEVOTE a special department to the manufacture of Brick particularly adapted both physically and chemically to

**Lime Kiln and
Cement Kiln
Construction**

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

**UNION MINING CO.,
Mount Savage, Md.**

CAPACITY, 60,000 PER DAY.
ESTABLISHED 1841.

**MOUNT SAVAGE
FIRE BRICK**

GOVERNMENT STANDARD



Phoenix Portland Cement

UNEXCELLED FOR ALL USES.

Manufactured by

PHOENIX PORTLAND CEMENT CO.

NAZARETH, PA.

Sole Selling Agent, **WILLIAM G. HARTRANFT CEMENT CO.**
Real Estate Trust Building, PHILADELPHIA, PENNSYLVANIA.

Ottawa Silica Co.'s Washed White Flint Sand

Is used for sawing stone in more than a dozen states. Cuts more and lasts longer than any other sand on the market. Unexcelled for Roofing, Facing Cement Blocks, White Plaster, etc. Freight rates and prices on application.

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TUBE AND
BALL MILLS**

Branches:

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PURE OAK TANNED LEATHER BELTING

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**FOR
DAMP
PLACES**



YOUR CHANCE!!!

An opportunity to
secure this space
will not occur
again in years.

**THIS SPACE FOR
SALE.**

HARBISON-WALKER

The Standard of Quality

You **know** what the linings for your cement and lime kilns cost per thousand brick but **do** you know how much per **ton** output?

That is the cost that is vital, that's why we are anxious you should know. Write us.

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PITTSBURGH, PENNA.

**HIGHEST GRADE
PORTLAND CEMENT
MANUFACTURED**



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1,000,000 BARRELS
YEARLY**



**A PERFECT RECORD FOR TEN YEARS
IN ALL KINDS OF CONCRETE WORK**

Send for 72 page Illustrated Catalog No. 25.

MARQUETTE CEMENT MANUFACTURING CO.

Chicago Office
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General Office and Works, LaSalle, Ill.



The Ironton Portland Cement Co.

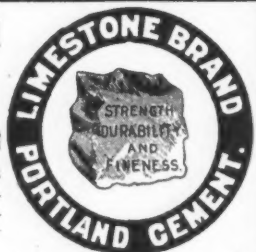
Manufacturers of the
Celebrated Limestone Brand of Portland Cement

Used by the Railroads in Kentucky, Ohio, West Virginia, and Virginia during the past five years. Cement as finely ground as any on the market. Guaranteed to pass all the standard specifications.

Plant located at Ironton, O., within easy access to seven States, namely, Ohio, Indiana, Kentucky, West Virginia, Virginia, Tennessee and North Carolina. Shipments via the N. & W. Ry., C. & O. Ry., C. H. & D. Ry., D. T. & I. Ry., or Ohio River.

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The Ironton Portland Cement Co.
Ironton, Ohio



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Stone Crushing Cement and Power Plants

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CHICAGO GRAVEL CO., - Chicago, Ill.
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High Tensile Strength, Finely Ground
Light and Uniform in Color.
Manufactured by the

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Western Office:
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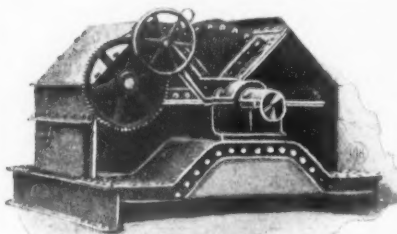
Capacity, 8,000,000 Yearly.

Washed White Silica Sand

Unexcelled For
Concrete and Plaster Finishes
Ornamental Concrete Stone—Exterior Plastering
Roofing—Sawing Stone and Marble, Etc.
Freight Rates and Prices on Application.

E. J. REYNOLDS and COMPANY
UTICA, ILL.

"PENNSYLVANIA" HAMMER CRUSHERS



For Pulverizing Limestone, Lime, Cement Rock, Marl, Shale, Etc.

Main frame of Steel; "Ball and Socket" Self-aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other Hammer Crusher has such a big Safety Factor.

PENNSYLVANIA CRUSHER CO.
Philadelphia
New York Pittsburgh



"CHICAGO AA"

1,250,000 Barrels Annually

HIGHEST QUALITY
"THE BEST THAT CAN BE MADE"

"Chicago AA" Portland Cement is best adapted for use in making concrete because of its absolute uniformity, fineness, prompt hardening and attractive color. "Chicago AA" is second to none, and every barrel is fully guaranteed to meet the requirements of the Standard Specifications.

CHICAGO PORTLAND CEMENT CO.
108 La Salle St. Booklets on Request. Chicago, Ill.

EVERLASTING "TE-PE-CO" WATERPROOFING

IF you are interested in concrete construction you cannot afford to call the job finished until you have made it **PERMANENTLY WATER-PROOF.**

Write us for "Te-Pe-Co" PROOFS.

We have shown engineers, architects, contractors and builders that "Te-Pe-Co" **WILL AND DOES** make cement, brick and porous stone structures waterproof.

Let us tell you why—and why every job is permanent.

WRITE FOR
NEW BOOKLET
NUMBER 26

The National Water-Proof Co.
614 Harvester Building
Chicago

Tell 'em you saw it in ROCK PRODUCTS



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Only
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White
is bor
Shield
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Rock Products

DEVOTED TO
Concrete and Manufactured
Building Materials

Volume IX

CHICAGO, ILL., JUNE 22, 1910

Number 12

White Sox Base Ball Park

Rapidly Nearing Completion, Presents the Latest Development in Reinforced Concrete Construction and Contains all Modern Conveniences for its Patrons.

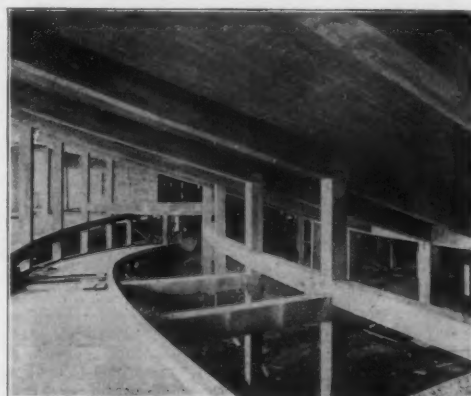
Only a few weeks hence and Chicago ball enthusiasts will celebrate the opening of the new home of the White Sox Base Ball Club. The new White Sox Base Ball Park now being completed is bordering on Thirty-fifth Street in the south, on Shields Avenue in the West, and on Thirty-fourth Street in the north, to be conveniently and quickly reached from any part of the city.

From the day Charles A. Comiskey, president of the White Sox Base Ball Club, commissioned his architect, Zachary T. Davis, who was the successful competitor among many architects and builders from Chicago and all over the country, no effort was spared to make the new White Sox Base Ball Park the finest and largest in the country. Before starting with the working plans, Mr. Davis and his assistant, Carl M. Vitzthum, went to St. Louis, Pittsburg, Philadelphia and Cleveland to make a thorough inspection and investigation of the new fireproof grandstands of the cities, profiting by their many points of success and also by their weak points in the way of seating such large crowds to the best advantage.

In designing the new ball park the architect and his assistant made it their principal study to give each and every one of the spectators a full view of the game at any point and at any time, and it can justly be said they have succeeded splendidly. Although built on a perfectly square lot, six hundred by six hundred feet, the right and left pavilions are brought in from the building line about fifty feet in order to bring the public in the pavilions closer to the foul lines and afford everybody a splendid view.

The base ball park consists of grandstand, right and left pavilions, right and left bleachers. The

whole place is perfectly symmetrical, resembling the shape of a great kite, the axis running through the center of the grandstand in the southwest-northeast directions. The main entrance to grandstand and pavilions is located on the southwest



VIEW BETWEEN DECKS—SOX BASE BALL STAND

corner of Thirty-fifth Street and Shields Avenue, while the bleachers have their own entrance at the northwest corner, on Shields Avenue. The grandstand is a so-called "double-decker," consisting of lower deck, or main deck, and upper deck. The

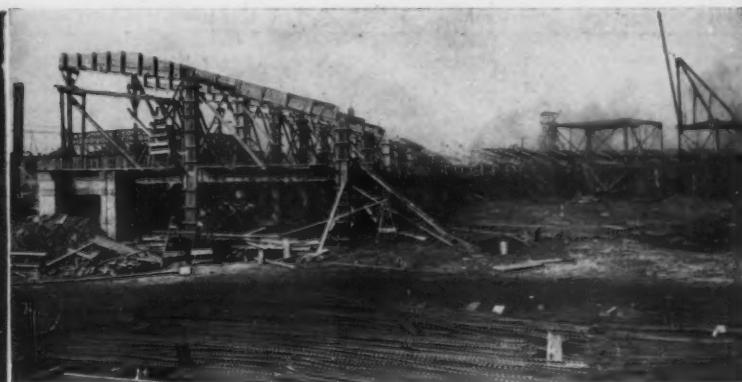
pavilions have only a lower deck, with roofs over them. All buildings are completely fireproof, that is to say, are built of concrete, steel and brick, and Universal Portland cement is used throughout. The general offices and private offices of the White Sox Base Ball Club are located under the grandstand, right over the main entrance, arranged in such a way as to give a perfect lookout over the entering crowds, and yet is in itself private in every way, being reached from the outside by private stairway. The club rooms, toilets, shower baths, rubbing rooms for the teams, have also been built under the grandstand on the same level as the general offices, away from the public, to be entered by private stairs directly from the players' boxes. Excellent preparation has been made for the housing of automobiles under the pavilions, and the scores are indicated by an electrical scoreboard manipulated from the press box in the center of the grandstand on the upper deck.

The grandstand is built on the plan of a horseshoe, the right and left legs running out straight on line with the pavilions, separated from the latter by a wide, open exit passage, connected, however, with the same overhead bridge. The entire footings under all buildings are built of concrete. The main deck is built completely of reinforced concrete, supported by reinforced concrete girders and posts about 16'6" apart. The concrete banks are 9" high and 2'10" wide, with the exception of the first eight rows, which are for the boxes and are 3'0" wide. The concrete posts under the main deck are 14" square at an average. Deep built-up steel trusses carry the upper deck and the roof over same, the load being carried down upon steel columns

(Continued on page 40.)



DETAIL VIEW OF REINFORCED CONCRETE GRAND STAND.



FORMS FOR REINFORCED CONCRETE GRAND STAND.

Power & Mining Machinery Co.

MILWAUKEE, WIS. U. S. A.

District Offices:

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"Half the size,
Half the weight;
Half the height,
Half the freight."

TO WHICH MIGHT ALSO BE ADDED:

"Half the efficiency,
Half the life;
Half the success,
Double the strife."

All the above at the same price of a real crusher, too, such as the

"McCULLY CRUSHER"



McCULLY CRUSHERS ARE NOT SOLD BY RHYME BUT BY REASON

By reason of their unequaled capacity and wearing qualities on rock and ore of any degree of hardness, and **WITHOUT MELTING ANY BABBITT.**

By reason of not requiring pumps for circulating the oil.

By reason of not requiring any cooling system for cooling the oil.

By reason of their unequaled efficiency under any and all conditions of service.

By reason of their unequaled economy due to minimum power, oil and repairs required.

By reason of many other "reasons",—too numerous to mention here, but which are contained in our new Catalog No. 4-R which is just off the press.

DO YOU WANT IT? THEN SEND FOR IT. IT'S FREE!

Principal Products

ROCK CRUSHING MACHINERY

MINING AND SMELTING MACHINERY

CEMENT-MAKING MACHINERY

WOOD IMPREGNATING PLANTS

POWER TRANSMITTING MACHINERY

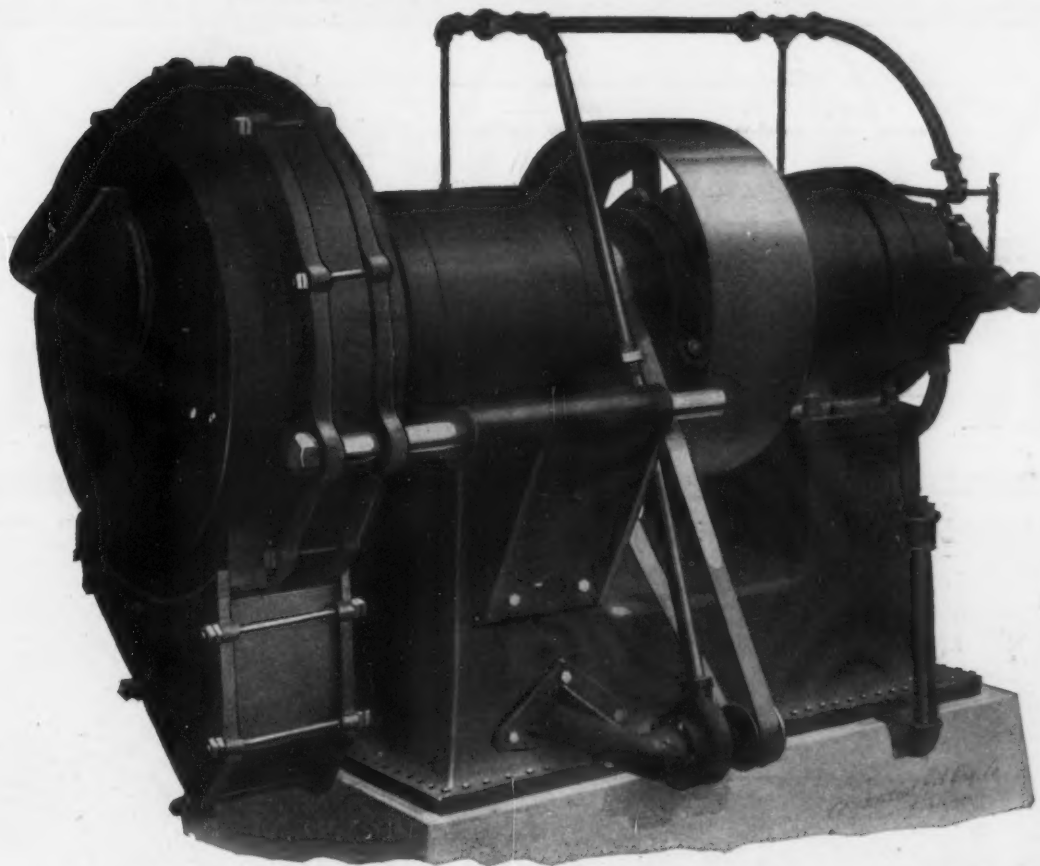
LOOMIS-PETTIBONE GAS GENERATORS

SUCTION GAS PRODUCERS

Write for Catalogs on any of Above, Mentioning this Journal.

The Symons Disc Crusher

Takes the Rejections from Any Gyratory Breaker
or Crushes Rapidly Gravel Pit Boulders



Makes Any Size of Product You Want Down to $\frac{1}{4}$ Inch

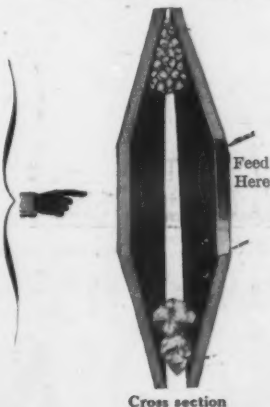
Quickly Adjusted for Different Sizes.

Does the Work at One Operation.

LOOK AT THE NEW PRINCIPLE!

How It Works

This crusher has two discs.
They are manganese steel.
Both of them are dish shaped.
Hollow sides face each other.
Form an angle with each other—
Neither disc moves sidewise.
Both rotate in the same direction.
They travel at the same speed.
One has a central feed opening.
Stone is fed between the discs.



Cross section

This Happens

Stone is caught between the discs—
caught where they are widest apart.
It is carried around with the discs—
carried to where they are closest together.
During its ride it is crushed—
crushed in going half way around.
The smaller particles fly out—
flung out during the next half round.
The larger pieces are caught again.
Occurs 400 to 600 times a minute.

What Happens?

It Happens in a Hurry !!

DO YOU SEE Why this crusher CANNOT CHOKE?
Why its CAPACITY IS IMMENSE!

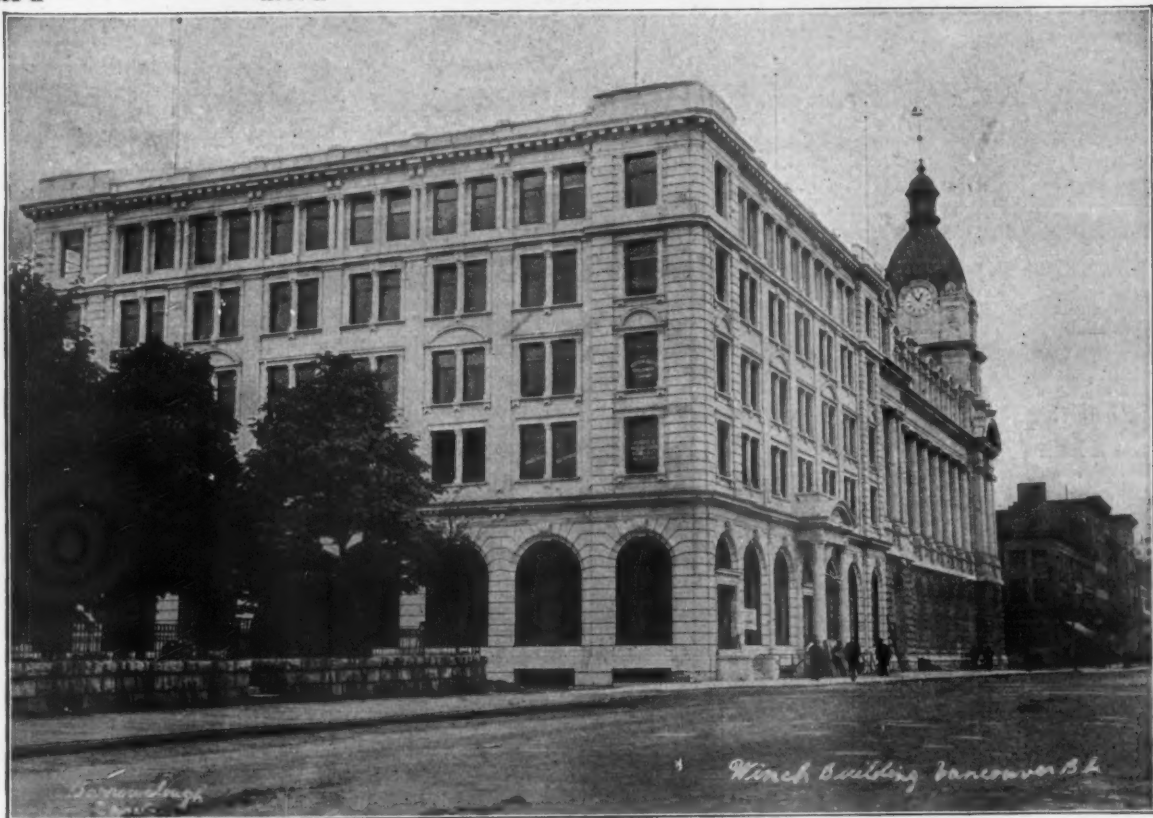
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TODAY

SYMONS BROTHERS

305 Old Colony Bldg.
CHICAGO

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Triangle Mesh Concrete Reinforcement



Winch Building, Vancouver, B. C.

Triangle Mesh reinforcement used.

Made by
American Steel & Wire Co.

CHICAGO, NEW YORK, DENVER, SAN FRANCISCO.

WRITE FOR ILLUSTRATED PAMPHLET

United States Steel Products Export Co., New York, N. Y., Export Representatives.

Hydrated Lime

Bulletin No. 34

When small per cents of hydrated lime are added to concrete it is an advantage in a number of ways:

- (1) The concrete works easier under the trowel.
It finishes easier.
- (2) It prevents drying out as quickly as it otherwise does.
- (3) It improves the color of the finished work.
- (4) It makes the concrete more impervious to water.
- (5) It improves the strength.

(1) Hydrated Lime is very fine. Its fineness exceeds that of the finest Cement by 9-10 per cent, that is, 94 per cent will pass 200 mesh, while the finest Cement placed on the market has a fineness through 200 mesh of 85 per cent. Hydrated Lime is 19-20 per cent finer than standard ground Cement, which have 75-76 per cent through 200 mesh sieve.

When small per cents, say 10 per cent, is added and well mixed the finely divided, flaky nature of the Hydrate reaches every part of the mass. On account of its lightness it follows the tendency of the moisture to work to the surface. In so doing the granular particles becomes coated with thin film of Hydrate and the mass offers less resistance to the workman's tools. Mixing is therefore easier. When the finish coat is put on the same is true and by the time this is well worked in place there is sufficient Hydrate present at surface to make floating and troweling easier. The finisher can do this important work much faster and easier.

(2) There is a tendency of concrete to dry out. This is true while it is being mixed and while it is in early stage of hardening. Drying out varies, but even in cold weather when a gentle breeze is stirring it goes on to some extent. In hot weather or windy weather it is greatest. To prevent this, work is protected or more water is used. It is also sprinkled after it begins to harden. Hydrated Lime, when added, prevents drying out. It has a tendency to hold the moisture in the mass.

(3) Hydrated Lime makes the color lighter. When work is well done and well finished the color should be a light gray. Through ingenious workmanship some very pleasing finishes are produced. Take any case, work is lightened in color several shades by addition of 10 per cent. It approaches white, the color desired in all finish work. Hydrated Lime overcomes any other color in the sand. In some localities sand is dark, sometimes a reddish color.

(4) The base of most water proof compounds is Hydrated Lime. The solubility of Hydrated Lime is 50-65 per cent greater than Cement. This heavily saturated solution in concrete crystallizes in the voids of concrete. It fills the spaces there as much as possible and makes the mass more dense. Cement has a tendency to do the same, but not sufficient in general work, to make the mass impervious to water.

(5) The all important result in concrete work is strength. When strength is increased by an improvement it is a success. Hydrated Lime when added in amounts of 5 to 10 per cent does improve strength.

Our business is the designing and constructing of Hydrating plants. To make this up-to-date material, we have the only process that has proved successful in hydrating a High Calcium and Dolomite limes.

It requires about four months to build a plant, why not take this matter up with us now and get ready for next season's business.

The Kritzer Company
115 Adams Street, - CHICAGO, ILLINOIS

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How to Own the Oliver Typewriter for 17c a Day

You don't have to draw on your Bank Account when you pay on the Penny Plan.

You need not disturb your Dollars. Keep them at work earning interest!

We offer our newest model, the Oliver Typewriter No. 5—fresh from the factory—for Seventeen Cents a Day.

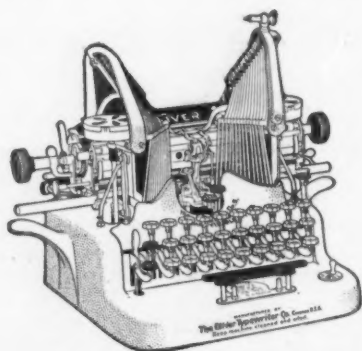
The plan is printed in "black and white" on the Application Blank below.

Simply fill out the blank, attach the small first payment, send it in, and on comes the Oliver!

No tedious wait! No red tape! No long-drawn-out correspondence!

You quickly own your Oliver and scarcely notice the outlay. You can have the use of your machine while pennies are "paying the freight."

You will never have a better chance to test the power of pennies.



The Oliver is everywhere.

It's the universal typewriter. Reels off real work [with the ease and speed demanded by this mile-a-minute age. Wherever you turn—in Business Offices, great or small—in the quiet of the Home—in the roar of the Railroad and Telegraph service—in the seething maelstrom of modern Newspaperdom—in countless kinds of service—it's the sturdy, strenuous Oliver that's "making the wheels go 'round.'"

The OLIVER Typewriter

The Standard Visible Writer

You need your Oliver now. It's yours almost for the asking. The biggest hundred dollars' worth in America—for Seventeen Cents a Day! Send along the Application Blank, with a small first payment of \$15 as an evidence of good faith.

Your check is good—or send draft, postoffice or express money order.

The Oliver Typewriter Co.

47-55 Dearborn St., Chicago, Ill.

APPLICATION BLANK

THE OLIVER TYPEWRITER CO.,

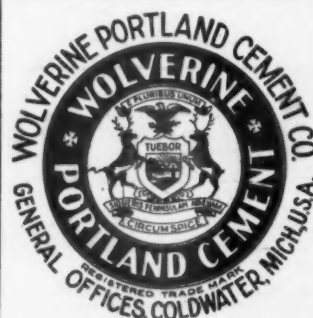
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Address.....

Town.....State.....

References.....



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The Alright Cement

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WORKS RIGHT
WEARS RIGHT

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Write for Booklet and Quotations.
Factories at Coldwater and Quincy, Mich.
Capacity 3500 Daily.

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W. E. COBEAN, Sales Agent,
Coldwater, Michigan

Main Office, Coldwater, Mich.



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HIGHEST GRADE of Portland Cement

Every Barrel Absolutely Uniform.

R. R. facilities especially adapted
for prompt shipments in
the northwest.

Capacity 1,500,000 bbls. Yearly.

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MASON CITY, IOWA

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of time and weather tried out Ricketson
famous "Red Brick" Brand.

COLOR

for Mortar, Brick, Cement, Stone, etc., and proved it to be
absolutely permanent. Red, Brown, Buff, Purple and Black.

Ricketson Mineral Paint Works

MILWAUKEE, WISCONSIN

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MR. CONTRACTOR—
MR. ENGINEER—**

WHEN you want a coating for concrete that will not destroy the desirable, distinctive texture of concrete, will give perfect satisfaction, will not chip, flake nor peel off, but will become a part of the material itself and will absolutely protect your stucco or concrete construction against the ravages of dampness as well as give it any tint you desire, apply **BAY STATE Brick and Cement Coating**.



We can give you the names of some of the largest mills, public and private buildings, as well as those of leading architects, who have used this coating with perfect satisfaction. It is much more durable than either lead or cold water paints and can be applied to a damp surface.

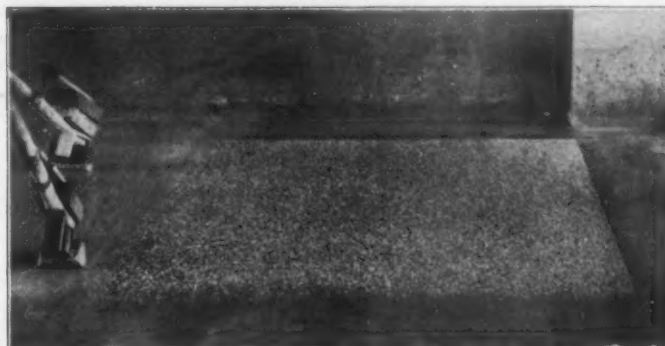
It will lessen the insurance rate because it has been endorsed as a Fire Retarder by the National Board of Fire Underwriters. Ask your dealer for it.

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**Paint and Varnish Makers
and Lead Corroders**

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**For Terazzo Floors, Mosaic Tile
Work, etc., no better material
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Trade Mark
"GRANITO"

Pure white in color with a firm, close
grain, it makes a light
finished surface of

Unequalled Durability—Absolutely Stainless

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GEORGE W. De SMET

PORTLAND CEMENT & WATERPROOFING COMPOUNDS
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Ceresit is now being used for the Harper Memorial Library (Chicago University) which is more than an ordinary waterproofing job. There is a reason why Ceresit is so widely known all over the world. Insist upon Ceresit being specified for your next building.

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Trinity Portland Cement

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Daily capacity, 4000 barrels. Write to-day.

Southwestern States Portland Cement Company

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Gas Process for Burning Lime.

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Does that look like economy to you?

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LIME

WE MAKE IT"

Lump - Barreled - Hydrated - Ground
STRONGEST IN OHIO.

We are not connected with any Trust or Combination.

WRITE US
PHONE US

The Scioto Lime and Stone Company, Delaware, Ohio

In Roman days **THREE YEARS** was none too long for

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to slake and cure. The Secret of the wonderful strength and durability of ye old time mortars was in the long time perfect slaking and curing. None other than a wet process will accomplish this production of a perfect lime putty.

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We Sell Lime and Hydrate

Do We Sell You? If Not, Why Not?

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GLENCOE LIME AND CEMENT CO.

MANUFACTURES LIME AND LIME-STONE FOR FLUXING

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High-Grade, Wood Burned
Hart & Page
LIME

Plants at
Rockford and
Ruby, Ill.
Sales
Department
Rockford, Ill.

FOWLER & PAY

Brown Hydraulic Lime, Austin Hydraulic
Cement, Jasper Wall Plaster, Brick, Stone

CEMENT WORKS: Austin, Minn.
PLASTER MILL: Ft. Dodge, Iowa
WAREHOUSE: Minnesota Transfer

MANKATO, MINN

CROWN HYDRATE

HIGH CALCIUM HYDRATED LIME

The Most Perfect Hydrated Lime Made
Kritzer Vacuum Process

MARBLEHEAD LIME COMPANY

KANSAS CITY

CHICAGO

Tell 'em you saw it in ROCK PRODUCTS

Below is given a letter received from C. W. S. Cobb President of the Glencoe Lime and Cement Co. of St. Louis, Mo. endorsing the Gas Producer Plant recently installed for his company.

Glencoe Lime and Cement Co.

St. Louis, May 2, 1910.

Mr. E. Schmatolla,
150 Nassau St.,
New York City.

My dear sir:

We confirm herewith that you left our new lime kiln and gas producer which you designed and lighted for us in good working condition. The Producer gives plenty of gas on natural draft even with an inferior (slack) coal which we have to use in consequence of the miners' strike. Thus far the coal consumption and output under adverse conditions are satisfactory, and we are greatly pleased with the simple and easy manner in which the kiln can be worked.

After our men become more familiar with the system, and a few details are worked out, we expect still better results than you have promised. The quality of the lime made by this gas system is entirely satisfactory.

I am,

Yours very truly,
(Signed) C. W. S. COBB,
President.

ERNEST SCHMATOLLA CONSULTING ENGINEER

150 Nassau Street, New York City

Branch Offices in London and Berlin

Specialist in designing, constructing and operating Gas Producers, Furnaces and Kilns for Rock Products, Chemical and Metallurgical purposes.

Longest experience and greatest success in PRODUCER GAS FIRED SHAFT KILNS for burning lime, dolomite and magnesite.

Many of these kilns, with daily outputs ranging from one to fifty tons per day, have been built in Germany, Austria, England, Russia and other European countries, also in America, Africa and Australia. Greatest economy in fuel and labor; very simple in operation, high class product, natural draft, all kinds of fuel, hard and soft coal, lignite, peat, wood and wood refuse. Best references.

MONARCH HYDRATED LIME

Cheaper and Better than LUMP LIME



Its value to you is greater because—

- It costs less to handle—
- It can be thoroughly soaked in 24 hours—
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- Carries more sand—
- Gauges with a third less plaster—
- Spreads further—
- Easier—
- Will not air slack—

You will be a MONARCH MAN if you once try
MONARCH HYDRATED LIME.

Our prices satisfies. Write us.
"We ship sudden"

The National Lime & Stone Co.

CAREY, OHIO

Limestone and Shale

FOR MANUFACTURE OF

Portland Cement

ON THE

Illinois Central Railroad

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WEST AND SOUTH

Coal, Water and Good Labor

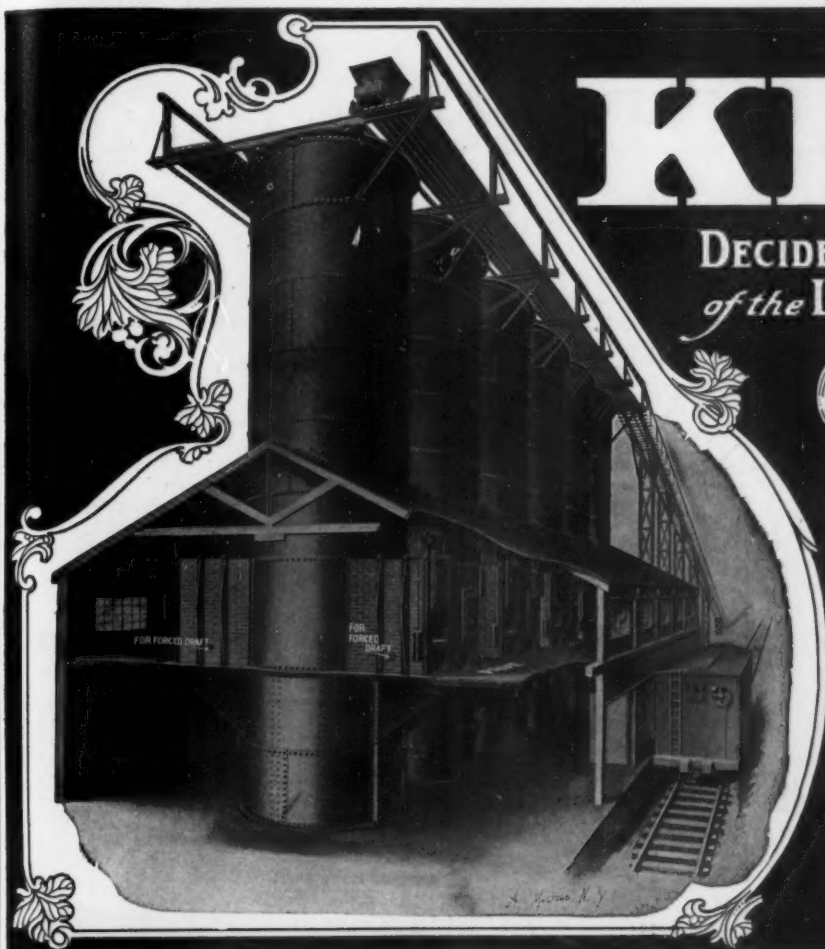
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J. C. CLAIR, Industrial Commissioner

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DECIDE *the* EARNING CAPACITY
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THE KEYSTONE LIME KILNS (Patented)

*are famous money makers
and express the highest type
of modern development.
There's none quite so good,
and the price is right.*

FULL PARTICULARS
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General Office: Indianapolis

Crushed Stone and White Lime

Sales Office at each Plant

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Lime Kilns at Portland, Ind.—Crushers at all 3 Quarries

Write the Plant nearest your Work for Prices

CRUSHED STONE, all sizes, SCREENINGS CLEAN

Connections with 6 Railroads

Modern Machinery and Screens

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Banner Hydrate Lime

Manufactured at Gibsonburg, Ohio, by the
National Mortar & Supply Company
 Offices: Pittsburg, Pa.

Daily capacity 150 tons

Ask for information

MITCHELL LIME

Is Chemically Pure and Practically Free from Waste

The Strongest White
 Lime on the Market.
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 Manufacturers, Chemists,
 Soap and Glue Works,
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Prices Cheerfully Submitted

Mitchell Lime Company

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Do You Have Cars to Haul?
The Davenport Locomotive
 Will Save Money



Special Designs for Special Purposes
 Any Size, Any Gauge, Any Weight
 Write for Prices and Particulars

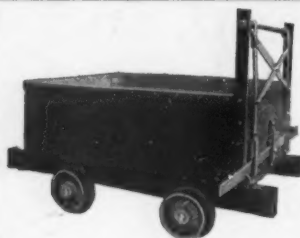
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DAVENPORT, IOWA

BRANCH OFFICES.

Chicago, 12 & 14 So. Canal St. Minneapolis, 107 3rd Ave. No.
 New York, 50 Church St. Seattle, 1215 1st Ave. So.
 F. H. Hopkins & Co., Montreal, Que., Canadian Representatives

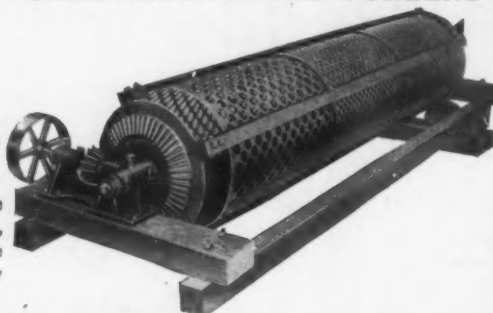
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Elevators

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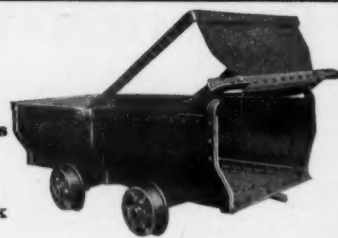


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Portable

Track



We manufacture a complete line of the above equipment. Also design and build special cars, buckets, hoppers. Send us your specifications—we will quote you promptly and believe we can show you we have what you want.

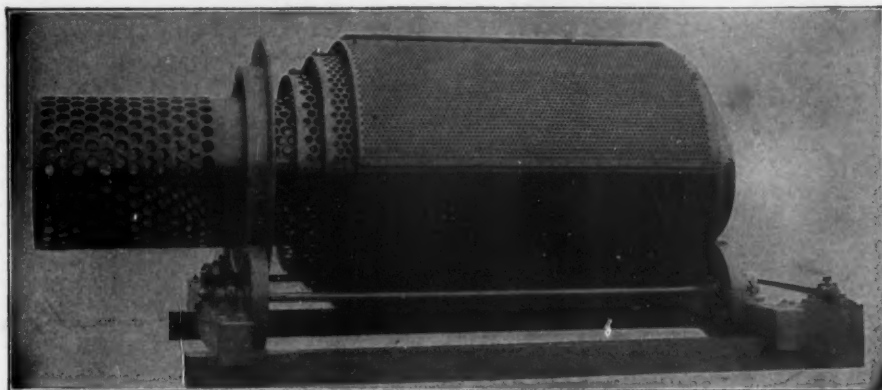
We have 5 new 1½ yard cars similar to the above in stock ready for immediate shipment. We will quote you price on these that should interest you. We also carry a stock of track, turntables, switches.

If interested send for Catalogue R-31, which illustrates kind and quality of equipment we make.

H. B. SACKETT SCREEN & CHUTE CO., - - 1679 Elston Ave., CHICAGO.

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JOHN O'LAUGHLIN'S SCREEN



The advantages of these screens are described in detail in a circular which WE WILL MAIL TO ANY ADDRESS. Mr. John O'Laughlin, the inventor, has designed many notable improvements in rock-drilling, quarrying, crushing and screening machinery, and uses these improved screens in his own crushing plants, which others have declared "to be the most perfect in existence in every detail." The O'Laughlin Screen is an important factor in the most modern and perfect stone-crushing plant.

JOHNSTON & CHAPMAN CO.

Corner Francisco and Carroll Ave., Chicago, Ill.

Perforators of Sheet Metals, Flat, Cylindrical, and Conical Perforated Screen Plates for Quarries, Mines, Reduction Works, Mills and all Industrial Purposes.

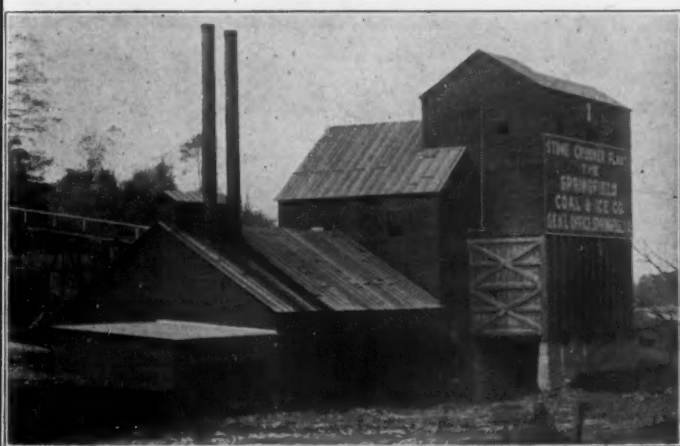
made solely by Johnston & Chapman, is the

ONLY SCREEN

on the market for wide-awake quarry-men and miners, who want to separate crushed granite, limestone or other minerals, gravel, sand, coal or coke. It will soon earn its cost in saving of repairs, and maintenance, and reduced power, and will do more and cleaner work than any other cylindrical screen of like area. No one can afford to keep old traps in use when the O'Laughlin installed

NOW

will from the moment it starts give a better and larger product, and a big interest on your investment in continuous saving in cost of repairs, renewals, and power. For particulars, address:



Osborne Crushing Plant of the Springfield Coal & Ice Co.

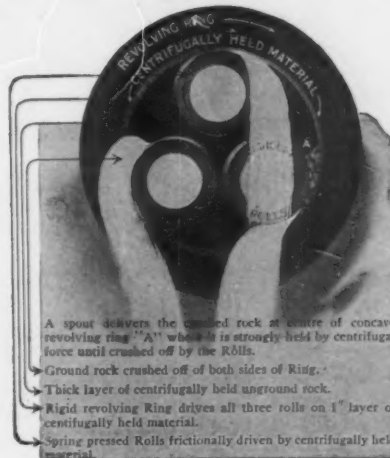
We are prepared to ship crushed limestone from $\frac{7}{8}$ to $3\frac{1}{2}$ inches on short notice.

On account of the high percentage (96 to 98%) carbonate of calcium, this material is especially suited for fluxing.

Excellent Shipping Facilities and Prompt Service.

The Springfield Coal & Ice Co.
SPRINGFIELD, O.

RING-ROLL PULVERIZER



FOR HARD AND MODERATELY HARD ROCK

OUTPUT

2 to 20 tons per hour.

FEED

$1\frac{1}{2}$ inch and finer.

PRODUCT

8 to 100 mesh and finer.

Send for Catalogue

STURTEVANT MILL Co., Boston, Mass.

Tell 'em you saw it in ROCK PRODUCTS

Amatite

ROOFING

A Frank Statement

HOW many manufacturers of ready roofing will tell you frankly how their goods are made?

Mighty few.

They will talk about "secret formulas," "special waterproofing compounds," etc.—all nonsense.

They don't tell you what the goods are made of because they don't dare.

From the start we have never hesitated to tell the buying public just what Amatite is made of and just what it will do.

How Amatite Is Made

Amatite is made of two layers of *Coal Tar Pitch*—the greatest waterproofing material known.

Alternating with these two layers of pitch are two layers of coal-tar-saturated felt to give it tensile strength.

On top of these four layers is a *real mineral surface*—five layers of protection. The mineral surface is permanent, fireproof, and absolutely requires no painting.



Amatite on Lumber Sheds of B. F. Harris & Sons, Brushton, N. Y.

It Needs No Painting

Roofings that require *painting* are a worry and an expense. Every year or two the owner has to give them a coating with some special compound, or he is pretty sure to have a leaky roof.

Amatite is Making Good

We are constantly receiving letters from customers telling us how satisfied they are with Amatite—how much better it is than the old-fashioned roofing.

Year after year, in all weather, Amatite will give perfect service without any painting or attention of any kind.

Surely this is the kind of service that wins and keeps customers.

Something Back of It

Remember, in this connection, that Amatite is made by the *largest manufacturers of roofing materials* in the world, and that when you buy this roofing there is something behind it. We stand back of every roll. We know we are offering the best and the most economical ready roofing on the market.

For sample, booklet and prices address our nearest office.

BARRETT MANUFACTURING COMPANY

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BOSTON

PHILADELPHIA

ST. LOUIS

CLEVELAND

CINCINNATI

MINNEAPOLIS

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NEW ORLEANS

KANSAS CITY

LONDON, ENGLAND

FOR BLASTING

Use the World's Only Successful Substitute for Dynamite

TRADE MARK

DYNALITE

REGISTERED

TWO PATENTS

WATER GRADE

We are now making a grade of DYNALITE known as "WATER GRADE" for use in blast holes and other places where it is necessary to use explosives in water. This grade is RED. Ask for it if you have water to contend with. Break up cartridges in water and take your time when loading, if you want to. Will also stand more cold than any other High Explosive made and give better results.

For Crushed Stone and Silica Sand Quarries, Contractors, Stump Blasting, Ore and Slag Shooting, Clay and Shale, Oil and Gas Wells, Etc.

Safer and Better Than Dynamite. Does Not Explode by Overheating. No Illness.

Manufactured by

The American Dynalite Co.

LONG DISTANCE PHONES

Magazines: Ottawa, Ill.; Akron, O.; Findlay, O., and others

SOLE OWNERS

Mills: AMHERST, OHIO

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"INDEPENDENT DYNAMITE—
Always consistent in price and quality."



INDEPENDENT POWDER
COMPANY OF MISSOURI

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FACTORY · · JOPLIN · MO.
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PIERCE BLDG., SUITE 655-67 · ST. LOUIS · MO.

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HERCULES SEMI-GELATIN
is a general favorite
in QUARRYING. Made
in all standard
strengths from 25%
to 60% inclusive.

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ST. LOUIS
TERRA HAUTE

1802
1910

EXPLOSIVES

E. I. DU PONT DE NEMOURS POWDER CO., Wilmington, Del., U.S.A.

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DYNAMITE

THE STANDARD EXPLOSIVE ALWAYS FULL STRENGTH
— ALWAYS THE SAME —

SEND FOR NEW 66-PAGE BLASTING MANUAL.

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THE AETNA POWDER COMPANY
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Bank of Commerce Building ST. LOUIS, MO.	33 North High Street COLUMBUS, O.	Woodward Building BIRMINGHAM, ALA.	Mass. Building KANSAS CITY, MO.	Torrey Building DULUTH, MINN.
Knoxville, Tenn.	Chattanooga, Tenn.	Iron Mountain, Mich.	Xenia, Ohio	

Tell 'em you saw it in ROCK PRODUCTS

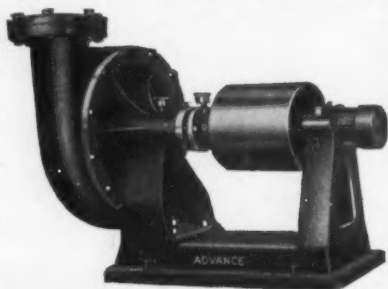
CENTRIFUGAL PUMPS HORIZONTAL : VERTICAL

Direct Connected to Motors—Belted or Steam Driven—Single or Multi-Stage—Highest Efficiency

Ask for Catalog 62

**Advance
Pump & Compressor
Company**

Battle Creek, Mich.



DIRECT HEAT

DRYERS

FOR

**BANK SAND
GLASS SAND
ROCK, CLAY
COAL, ETC.**

All Mineral, Animal and Vegetable Matter.

We have equipped the largest plants in existence and our dryers are operating in all parts of the world. Write for list of installations and catalogue S. C.

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The Buckeye Fire Clay Co.

Manufacturers of

Sewer Pipe, Flue Linings, Chimney
Tops, Fire Brick, Grate Tile, Ground
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FIRE BRICK

For Cement Works, Lime Kilns, Cupolas, Steel and Iron
Works of every description.

LOUISVILLE FIRE BRICK WORKS, Highland Park, Ky., P.O.
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RUGGLES - COLES

DRYERS

RUGGLES-COLES ENGINEERING CO.

NEW YORK

CHICAGO

**The Cummer Continuous Gypsum
Calcining Process**

See Other Advertis-
ment, Page 73

THE F. D. CUMMER
& SON CO.
Cleveland, Ohio

Seven plants in successful operation producing about 1,500 tons per day.

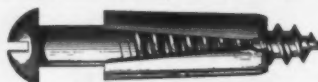
THE WINANT COOPERAGE CO.

Staves, Hoops and Heading for Lime,
Cement and Plaster Barrels

MILLS:
Pennsylvania New York
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190 CEDAR STREET
NEW YORK, N. Y.

Farrington Expansion Bolts



The most secure fastening in concrete as well as in stone.
Send for Samples.

H. Farrington, 45 Broadway, New York

C. K. WILLIAMS & CO.
EASTON, PA.

The Largest Manufacturers in the U. S.

BRICK AND MORTAR

COLORING

OF ALL SHADES

CORRESPONDENCE SOLICITED. SAMPLES AND ESTIMATES
CHEERFULLY FURNISHED ON APPLICATION.

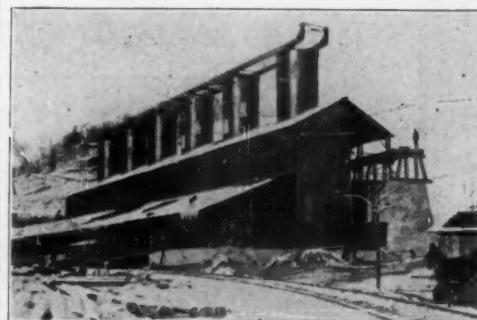
To Dispose

OF YOUR

**Old
Machinery**

PLACE AN AD
IN OUR

**Classified
Section**



Lime Kilns and Plant of Blair Limestone Co.,
Canoe Creek, Pa.

Designed by

**Henry S. Spackman Engineering
Company**

42 N. 16th Street Philadelphia, Pa.

Rock Products

ESTABLISHED IN LOUISVILLE, KY., 1902.
DEVOTED TO CONCRETE AND MANUFACTURED BUILDING MATERIALS.

Volume IX.

CHICAGO, JUNE 22, 1910.

Number 12.

Publication day, 22nd of each month.

THE FRANCIS PUBLISHING COMPANY

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Communications on subjects of interest to any branch of the stone industry are solicited and will be paid for if available.
Every reader is invited to make the office of Rock Products his headquarters while in Chicago. Editorial and advertising copy should reach this office at least five days preceding publication date.

TERMS OF ANNUAL SUBSCRIPTION.

In the United States and Possessions and Mexico \$1.00
In the Dominion of Canada and all Countries in the Postal Union 1.50
Subscriptions are payable in advance, and in default of written orders to the contrary, are continued at our option.
Advertising rates furnished on application.

Entered as second-class matter July 2, 1907, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879.

Make hay while the sun shines. This is the time for the builders' supply men and the concrete workers to make money.

What we need is more system in the handling of builders' supplies. How on earth the average dealer can tell whether he is making money or not is beyond comprehension.

Concrete streets and roadways are being put down in a great many cities today. The industry is yet in its infancy. We look to see fifty percent of all the streets in every city put down with concrete.

The cement manufacturers are having their inning now. Despite the fact that there are comparatively few gigantic projects, the immense number of smaller operations make up a tremendous demand.

Optimism ran high at the meeting of the Association of American Portland Cement Manufacturers in Chicago recently. This is the first time in quite a while that the manufacturers were in a position to smile.

The year 1910 promises to be a record breaker as far as building operations are concerned. Reports from all the leading cities seem to indicate that the early spring rush has kept up to a large extent, and the chances are that the year will round out a big one.

The business man who feels that he is getting the short end of the deal is always a strong advocate of coöperation. By the way, no one can tell just where the lightning may strike next, and it's always good form to be in line in case one may ever find oneself in need of neighborly action of this kind. Just think it over a bit.

The thousands of small consumers of cement roll up a wonderful total volume. It is felt and appreciated in those times when the big things like the railroads and municipalities are slow in coming across with their usual quota. There is good proof that the very intelligent educational campaign is bearing the right kind of fruit.

The men to get behind the concrete street and roadway movement are the crushed stone operators, who would be the ones to benefit most largely by the adoption of this character of paving. Some of them have made investigations along these lines and are prepared to give the facts and figures. If the crushed stone operator would coöperate with the concrete worker in his town, the probability is that the two together could start a paying business.

Much the larger part of the lime kilns are fired with coal direct in spite of the known wasteful element inseparable from such a method. Wood is never to be considered again as an available fuel for lime-burning. Gasification of coal has been proved both economical and successful, and eventually this will be the only way to use the coal. The rotary kiln of the horizontal type has not yet come into use, but the time is not far off when the same kind of burning which has been so successfully employed in burning cement composition will be applied to lime-burning in conjunction with producer gas.

Plastered exterior treatment of residences is the most noticeable as well as the best modern development. In this particular branch the European adepts have far excelled the Americans. Practically every country of the Continent as well as the British Isles has many of the best examples of substantial homes finished in this way. Chicago, the most remarkable city of the world in many ways, has taken a distinct lead in this direction. On a recent drive through the most exclusive suburbs a few days ago no less than sixty-five plastered houses were counted, all of them distinctively artistic and imposing in appearance. It clearly indicates the arrival of the new vogue of good taste as well as sensible economy.

In nearly every large city civic improvement leagues are evolving plans for the improvement of their municipalities along architectural lines. There is room for great improvement in the majority of cities, as Americans are just beginning to realize that while they have progressed commercially they have stood still architecturally speaking. Few of our big cities have anything to commend them from the standpoint of beauty. Their immense public buildings as well as private structures have all been built with the single purposes of making them useful. Group plans have seldom been considered in the past. The country is still young and there is ample time for these improvements to be made. As times goes on these changes will cost more. There is no reason why our cities cannot be made as beautiful as those of older countries. We have the wealth and the brains and the materials. All we need is the impetus. Some of our greatest architects are turning their minds in this direction. The next decade will undoubtedly see the beginning of some of these gigantic projects if not their actual consummation.

Every month we receive inquiries for information on subjects pertinent to the building material business from subscribers, and others who have been directed to us as the only repository upon such matters. Very often, upon investigation, we find that the whole matter has been fully described, illustrated and discussed in a previous issue of the paper, or one not very far back, and in some cases in the current issue now lying on the desk of the man making the inquiry. Those who are so blind to their own interests as not to be on the regular subscription list have an excuse because their case is hopeless or nearly that; certainly they could never locate a rose bush in full bloom after night, or anything else requiring the smallest fraction of a grain of reasoning. But the members of the Rock Products family are a very different class of business men. They can by a little more careful reading familiarize themselves with the whole scope of activity in building material and their best application in the examples which we illustrate from month to month. Take the time to improve your individuality even at some cost of effort to hold yourself down to the task. It is the men who are constantly growing broader and piling up resources of accumulated knowledge, which, when applied practically, is named "ability," that take the lead and build up great enterprises to earn dividends measured in seven figures. If you are guilty of overlooking your opportunities of this character, start now to make a bigger unit of yourself. There is no other way.

EDITORIAL CHAT

Alexander D. Ney, inventor, of Elmhurst, Ill., recently exhibited in our sanctum some samples of very excellent concrete which he had produced by his newly patented system of wet process concrete. He claims nothing short of perfection in the work he produces under his system, after no less than twenty years of constant study and practice of this one type of work.

A. E. Manierre, concrete specialist, formerly of Nashville, Tenn., has recently associated himself with the architectural establishment of Robert T. Newberry in the Temple, La Salle and Monroe Streets, Chicago. He is of that type of enthusiastic young men who make good every time.

William Sewell, C. E., of Whitburn, Sunderland, England, who enjoys the distinction of being the only honorary member of the National Lime Manufacturers' Association of the United States, is visiting friends and relatives in Chicago. He first introduced hydrated lime in English markets a few years ago, using the Kritzer process with pronounced success. In the line of concrete Mr. Sewell also occupies a position in the front rank, and was awarded a prize at the last Chicago cement show in connection with the competition for excellence in concrete products given by the Century Cement Machine Company.

V. R. Salinger, president of the Puntenny Lime Company, Los Angeles, Cal., recently honored our sanctum with a call. One of the earliest hydraters of lime on the Pacific coast, he says it is the only successful way to handle lime. He was headed East to Dartmouth to attend the reunion of his class, and incidentally expects to call upon several of the leading lime manufacturers to see how they make lime three thousand miles from his own kilns. Wood is still cheap enough in his section to make the fuel problem a bagatelle. This will revive pleasant memories to some of the lime burners east of the Rocky mountains who once thought that wood was the only fuel to be considered.

A. A. Pauly, inventor of concrete structural tile, and extensively interested in the manufacture of that premiere product of cement, wears the smile of contentment that won't come off. Unqualified success of all the plants making his kind of goods is the best explanation.

Horace MacRobert, Jr., who has been traveling Wisconsin the past four years for the Universal Portland Cement Company, is now associated with the United States Silica Company. Mr. MacRobert will cover the same territory with the new material he sells.

Mr. Farrar, of Farrar & Jepson, Raid City, S. D., was a Chicago visitor this month. Mr. Farrar is looking into the matter of the manufacture of lime in his vicinity. They also have a gypsum deposit and intend to build a plaster mill. They have let the contracts for this work, which will proceed immediately.

J. B. Tuthill, president of the Tuthill Building Material Company, had a painful time three weeks last May suffering with a serious attack of pleurisy. He has now fully recovered, however, and has been conducting his business as usual for the last two weeks.

W. B. Hill, president of the Ash Grove Lime and Portland Cement Company, has gone to Europe on a vacation. He was accompanied by Mrs. Hill and the two expect to spend about two months touring the main points of interest in Europe. They took passage on the giant liner Lusitania on the 19th.

W. H. Fisher, president of the Fisher Hydraulic Stone & Machinery Company, desires us to announce that his interests have been removed to Mt. Gilead, O., where the works and machine shops of his concern are located.

The offices of the Kritzer Company, the far-famed specialists in the lime hydrating plants, have been removed to No. 1130 in the Commercial National Bank building of Chicago, where Mr. Kritzer

invites all of the progressive members of the lime industry to call upon him when they are in Chicago. The new telephone number is Randolph 4396. Incidentally Mr. Kritzer remarks that the hydrating business is all to the good and growing like the crops with each succeeding season.

The newspapers interviewed John L. Wheat, of the Union Cement & Lime Company, frequently during the period of interest surrounding Halley's comet, because Mr. Wheat is one of the few Louisville citizens who saw it when it appeared seventy-five years ago. And Mr. Wheat isn't so old at that.

Dan Macknet, leader in builders' supplies at 612-620 East Cerro Gordo Street, Decatur, Ill., spent a few days in Terre Haute, Ind., during the G. A. R. Encampment last month. He there closed negotiations with E. F. Kellie, president of the U. S. Kellastone Co., for handling this new and popular water and fire proof building material for buildings. He will make it as popular in Decatur as it is in Terre Haute. Such is "Dan's" record when he takes hold of anything.

Captain E. B. Schmidt was the city engineer of Terre Haute for four years and made a memorable record in his office during that period. He was superintendent of concrete construction work from 1904 to 1906 on the Cairo division of the Big Four road and had charge of the biggest bridge in this division under construction, over the mouth of Big Creek at Marshall, Ill., on which he was complimented by the road. He accepted the offer of the U. S. Kellastone Company last fall to become chief engineer of the company.

Paul Smith of the Michigan Plaster Company spent a day last month in Terre Haute, Ind., mending his fences in that section, if they needed it. He was full of life, full of business, and looked as if things were coming his way. They usually do.

James W. Landrum, secretary, treasurer and manager of the Terre Haute Coal & Lime Company, was seriously ill last month, and for three weeks his family and friends feared grave complications. He is convalescent and will soon be about again as usual.

J. O. Freeman, manager of the Northwestern Clay Manufacturing Company, Griffin, Ill., was a Chicago visitor this month.

Sam Goucher, of the Toronto office of the National Fireproofing Company, spent some time in Chicago the past month.

Lucius I. Wightman, for the past six years advertising manager for the Ingersoll-Rand Company, 11 Broadway, New York, has resigned his position, the resignation taking effect August 1. He will open an office in New York City as an independent specialist in machinery advertising, handling the accounts of manufacturers of machinery and engineering products.

Mr. Wightman brings to his new enterprise qualifications peculiarly fitting him for this line of work. To his long experience in managing one of the largest advertising accounts and publicity departments in the machinery field, he joins a prior experience of years in practical mechanical and electrical engineering, construction work, machine design and manufacture, and machinery selling.

He is a graduate engineer, the author of a textbook on compressed air, and one of the authorities on compressed air subjects. His broad acquaintance in the world of trade and technical journalism, his understanding of advertising mediums and methods, and his intimate knowledge of engineering in many phases, will prove invaluable to those whose advertising accounts are placed in his charge.

The higher the building, the higher the pay, is the logic of some hod carriers at Alton, employed on the new elevator of the milling company there. Up to the 50-foot mark they were satisfied with 22½ cents an hour. Now they think they are entitled to an increase of 10 cents an hour. As the elevator is to go up 70 feet more, the contractor is figuring what the hod carriers will want on the last ten feet on this basis.

John Slater, who is 91 years old, employed as a quarry worker at Alton, Ill., fears to quit manual labor and continuing to lift heavy stones. He retires at 8 p. m. and is up every morning at 4:30. He is a native of England, smokes and chews and is in vigorous health. Asked what he thought of old men being chloroformed, he replied, "Dr. Osler is a fool." He expects to keep on showing young men how to do quarry work for a good many years to come.

VERY PLEASANT OCCASION.

On Wednesday, May 25, the Illinois Chapter of American Institute of Architects, Chicago Architects' Business Association, Masons' and Contractors' Association and the Builders' Club were the guests of the Universal Portland Cement Company and were taken by special train to the cement mill at Buffington and the steel plant at Gary. A delightful luncheon was served while en route from Buffington to Gary. It is seldom that a party evinces such an interest as was shown by each and every one on the trip. The occasion was a very happy one.



CHICAGO ARCHITECTS, CONTRACTORS AND BUILDERS AT BUFFINGTON, IND.

CIVIL ENGINEERS MEET.

At the time of going to press the forty-second annual convention of the American Society of Civil Engineers is in convention at the Congress Hotel, Chicago.

The opening was held on June 20, and the day was given over to an informal reception which was held in the Florentine Room of the hotel.

The first meeting of the convention was held at 10 a. m., June 21. John A. Benschel, president of the society, made his annual address, at the close of which the business session was held. This consisted of the report of the board of direction in the matter of a proposed special committee to report on the preservation of wood; the time and place for holding the next annual convention; report of special committee on rail sections; report of a committee appointed to formulate the general lines which should be followed in legislation affecting the practice of engineers.

In the afternoon automobiles were provided to take the members and the visitors through the park system of this city.

In the evening an illustrated stereopticon lecture was given by Alfred Noble, past president of the society, who described the work of the New York tunnel extension of the Pennsylvania railroad.

On June 22 the program provides for a trip to Gary, Ind., to visit the steel plant of the United States Steel Corporation. The trip is to be made by steamer, and the inspection of the plant as well as visiting about the city of Gary is included.

In the evening J. Waldo Smith, M. Am. Soc., C. E., addresses the society on the subject of the "New Water Supply for the City of New York." This also is to be illustrated by stereopticon views.

The program for June 23 consists of four short excursions to points of local interest. Parties will be made up and will be personally conducted.

In the evening a lecture will be given descriptive of the plans recently perfected for beautifying the city of Chicago, after which the Chicago Engineers' Club will entertain at a smoker.

On June 24 a special train has been chartered to take the visitors on a trip over the north suburbs of Chicago. This will include a visit to the new United States Naval Training Station at Lake Bluff.

FEARFUL COST OF WOODEN CONSTRUCTION.

The recent fire in Seattle, while not expensive in money value as great fires go—six blocks being burnt over with a loss of over \$1,000,000—was a terrible calamity to hundreds of families.

The evolution of a city is familiar to all persons. In earlier years, the beginning was the log house, followed by the frame dwelling, to be replaced, in turn, by brick and, in later times, by stone and concrete structures, with, however, too large a proportion of wooden buildings still within the city's limits, erected prior to the enactment of an ordinance forbidding the erection of buildings of that material.

No matter what the initial cost, a wooden building is an extravagance—especially in a large town. In the old days, when buildings were constructed with heavy timbers and thick flooring, conditions were not as bad as in these days when the invention of re-saws and band-mills of narrow kerf makes it possible to frame a large building out of two-inch stuff, floor it with boards dressed to less than an inch, and side it with material half as thick, it is a more dangerous proposition. Such a house is simply a complex invitation to a fire to quickly convert it into ashes.

The Chicago fire started in a wooden shanty and, prior to this, the greater part of Portland, Me., was destroyed on account of being largely built of wood.

These fires, to some extent, reach us all. The country is made poorer through this wholesale destruction of property. It is easy to realize this if one will but imagine the destruction of all property by fire now existing in the United States.

The difference in the cost of insurance is also a factor to be reckoned with and constitutes a part of the expense of the maintenance of a wooden building over that of a more substantial structure, and the life of a wooden building is far shorter under ordinary conditions of wear and tear and exposure to the weather.

These considerations, together with the matter of the proper conservation of the timber of the country for purposes for which nothing else will properly serve, emphasizes the importance of an even more rapid adoption of concrete construction than modern methods call for and modern conditions so emphatically demand.

CONCRETE FENCE POSTS.

As a material for fence posts concrete has been found to possess but few of the disadvantages of wood, to have practically all its advantages, and to be superior in some respects to timber. Of course, the first cost may be more or less than the best wooden posts, but that depends on local conditions—the timber supply, the deposits of sand, gravel and rock, and the skill of the workman. If manufactured as usual and cured for three months concrete posts are as good as the best wooden posts. After three years wooden posts possess only one-third to one-half of their original strength, whereas concrete grows stronger with age and needs no repairs, as neither weather nor fire injures it. Under ordinary circumstances concrete posts will last forever; and even if in the course of years a few should be broken by unusual strain, it is cheaper to replace them than to replace an entire fence of decayed posts with a material with the same lack of durability.

Concrete posts are attractive in appearance because of their uniform size and color, and can be made either square, triangular or round, either straight or tapering towards the top. They can be purchased from dealers or made at home, and this latter plan, together with suggestions as to the construction of the fence after the posts are made and cured, is the theme of Farmers' Bulletin No. 403, recently issued by the United States Department of Agriculture. The author takes up in detail the selection of sand, gravel, crushed rock and cement; the choice of molds—either steel or wooden, and if



CHARLES SCHMUTZ, SALES MANAGER CRESCENT PORTLAND CEMENT COMPANY.

wooden, the proper way to make square or triangular molds. Reinforcement is discussed as to the principle involved and the kinds of reinforcement best suited to certain needs. The work of mixing, molding and curing is explained with minuteness, and the variety of styles which can be produced described. Under "fence building" is given instruction as to setting the posts, attaching the wire, stretching the fencing, and the use of line anchors. Nine illustrations give detailed drawings of molds, methods and results. The pamphlet closes with a warning to persons intending to buy post molds, either steel or wooden, to beware of traveling agents who are selling molds or rights for the sale or use of their respective molds. No dealings should be had with these agents except when fully satisfied through reports from one's banker or lawyer that the company represented by the agent is reliable and that the agent is their authorized representative. Patents have been issued on special types of reinforcement, and they can not be generally used without danger of infringing patent rights; but none of the simple forms described in the bulletin is patented or patentable, and they are just as good as the special forms advertised and recommended by the agents. No one need hesitate to use the simple form of construction recommended, for it has been in common use in all countries for a number of years, and all claim that the general use of reinforced concrete fence posts is

controlled by patent rights is unjustified and untrue.

ECONOMIC SETTING OF STEAM BOILERS.

At a recent meeting of the Leeds (Eng.) University Engineering Society, M. Sykes contributed a paper on steam boiler settings. The correct setting of boilers contributes largely to their economy and efficiency, and is therefore a matter of importance. Flue walls should be built with stagnant air cavities 1½ in. or 2 in. wide, between the firebrick lining and the main structure of the wall; or, if the space available does not admit of this, cavity bricks may be used. Short-circuiting of the flue gases should be guarded against, and sharp corners and sudden curves avoided. All rivets and joints should be either open to inspection or easily uncovered and recovered. Broad surfaces of brickwork in contact with the boiler should be avoided, as they tend to shorten its life through corrosion. Down-takes are best covered with iron frames and plates, with manholes or soot doors. Swivel dampers admit a minimum of air, but where slide dampers are installed, a brickwork sleeve may be built above the flues, covered at the top by a flag or iron plate through which the actuating rope or chain can pass. Boilers should be set to fall slightly towards the front, and blow-off pipes should never connect straight into the drain. Flues should be built of sufficient area to enable the boiler inspector to pass through, and allow for ample expansion of the gases at not too high a velocity. Large flues mean better combustion by natural draft, and greater absorption of heat by the boiler. With an economizer, large back flues to the chimney are desirable, but if the gases pass direct to the chimney the area of the flues may be reduced to, say, three-quarters of the area of the combined flue tubes of the boiler.

IMPORTANT CHANGE.

In an interview with O. U. Miracle on June 6 he made the following statement:

"We consummated a deal whereby the Marsh Company, 970 Old Colony Building, Chicago, take over the entire manufacturing and selling interests of the Miracle Pressed Stone Company, of Minneapolis. The headquarters of the concern will be at the above mentioned location.

"George C. Marsh is too well known to contractors and concrete machinery interests to require any comment. We feel in turning the business over to the Marsh Company that a more worthy successor could not have been found."

"It is with many feelings of regret that we retire from the activities involved in conducting the business of the Miracle Pressed Stone Company. We are not unmindful of the obligations we owe to the trade papers and to our thousands of customers and friends, who have made it possible to build up the largest business of the kind in this or any other country. Our active and successful customers are found in nearly every civilized country on the globe, and it is with some pride that we realize that we have made the name Miracle known wherever concrete is used.

"We wish to assure these thousands of customers and friends, as well as the many new customers that will come to the new concern, that they will receive the same courteous and fair treatment from the Marsh Company as they have received in the past from this concern.

"We have for a number of years been identified with extensive contracting operations in the middle West, and from this time on will give our entire attention to this business.

"We wish through this medium to again express our most sincere appreciation of the liberal patronage of our over ten thousand customers, and wish them every possible measure of success."

Charles Schmutz, who has been associated with the Crescent Portland Cement Company, Wampum, Pa., since last October, has been promoted to sales manager. Mr. Schmutz says that business at the present time is exceptionally good and prices are advancing every couple of weeks. The capacity of the Crescent mill is 4,000 barrels daily. His many friends in the trade will be pleased to learn of his promotion and Rock Products joins with them in wishing him every success.

D. H. McFarland, assistant general sales manager of the Atlas Portland Cement Company, New York, was a Chicago visitor this month and, in company with John Evans, honored Rock Products' sanatorium with a call. Mr. McFarland says the big Atlas mills are rushed to the limit.



The National Builders' Supply Association

Meets Annually.

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Official Organ, ROCK PRODUCTS

GET BEHIND IT.

A recent letter from James W. Wardrop, the national secretary of the National Builders' Supply Associations, contains a whole lot of timbre for the consideration of the substantial dealer in every market of this country. Recently Wardrop was likened unto one of those mighty freight engines that uses its steam in double expansion and runs sixteen drivers, and it is well taken, as his own remarks, following, exhibit:

During 1908 the secretary commenced to sow the seed among the dealers of the New York City district. During 1909 this tender plant was watered freely, sometimes with tears, and we are now doing our very best to gather in a crop which is coming along nicely and has every appearance of success.

We landed here on the 15th of the month, and after we had put our harvesting machine in order we had a conference with our national president, Mr. Warner, who injected considerable steam into the boilers and pronounced the machine "ready for anything."

Our first call was to the office of one of the largest and wealthiest builders' supply dealers in the United States, and composed of men of large experience in the business and who stand high in the community and the trade of this great city.

We were given a very courteous reception and hearing, at the end of which one of the partners remarked that he would like to present the proposition to his partner. The latter entered the office before the secretary left. When the usual introduction had taken place, the first partner explained our mission to the newly arrived partner, and the latter, looking across the desk, remarked: "Well, it's a good thing; let us get behind it."

You can imagine the effect of this speech on the secretary of the N. B. S. A. You talk about aviation and the success of navigation in the air, but the flight of Mr. Curtiss from Albany to New York, or the flight of Mr. Hamilton from New York to Philadelphia and return, was simply a little practice in the back yard compared to the N. B. S. A.'s airship flight in the imagination of the secretary; for in less time than it takes to tell it, that airship had made a trip around the whole of the United States, and from the dizzy height of its course had flirted with another hemisphere, while the applause of the progressive dealers of the country rolled in upon the venture to the tune of the words of the

quick decision of the giants of the business as he said "Get behind it."

In the occasion which closed the year 1909 and has given impetus to the work of 1910, the eleventh annual convention in Chicago in February last, the predominating note of that successful and determined effort is due to the enthusiasm, keen business vision, and sledge-hammer action of the old war horses of the trade; and I sometimes think that if some of the younger dealers, who are still on the front end of their mileage and are still really raw recruits in the business, did not have the vim, push and determination of these old war horses "behind it," some of these fellows who are always looking on the dark side of things and seem to think that everybody else is against them, and that somebody always owes them something, would find the conditions of today much worse than they are, and perhaps there would be nothing to "get behind."

In every line of work, and especially in the builders' supply business, to make life worth living and to get something in return for effort, the dealers of the country should "Get behind it."

The inspiring spirit of 1776 is nothing short of a principle supported by determination and backed up by the heroes who "got behind it"; and the same principle holds good even down to the new fashioned way of driving a mule.

The N. B. S. A. has been preaching this doctrine for twelve years and in the majority they have practiced what they preached. Any man who would like to have a mental vision of what might have been has only to shut his eyes and imagine the conditions if some determined men had not "got behind it."

Of course the secretary secured the application of the firm in question; and with such men as that "behind it" there seems to be no good reason why the New York City district as well as the New England states should not loom up in good shape in our membership list. It may not be done in a day, and it may not be done in a month, but the spirit is there just the same, and while secretaries may come and secretaries may go; while war horses may drop out and others take their places; and while the time may arrive when trade papers will secure the abundant support that they so richly merit, and builders' supply dealers may even go so far as to use the columns of ROCK PRODUCTS at regular space rates to ascertain where to apply and how to get into the National Association, regardless of what it costs, this spirit makes it safe to say that long after the "dead ones" have finished their "swan song" over conditions introduced and assisted by their own apathy—conditions they have never raised a finger to remove nor spent a cent to remedy—and these have passed off the stage of serious consideration, "the Old Guard" will have rolled up a splendid majority and will have retired to the reward of the "get-behind-it" spirit only to make way for a new generation of live ones who will repeat the record and again prove the value of associated effort, to the praise and profit of all those who have good common sense enough to "Get behind it!"

The gentlemen of New York City who so quickly grasped the situation and jumped into the saddle are safe men for all other dealers in New York City, New England and everywhere to follow, and we hope to hear that a large army of dealers have "enlisted" before our next issue.

THE COST OF HANDLING BUILDERS' SUPPLIES.

There are two items of cost in the operations of the builders' supply business that make up 75 per cent of the total of the margin between the manufacturer's delivered price and the seller's delivered price. The first item is the selling cost. In olden days there was no organization of the sales department in the builders' supply business, but latterly it has been our pleasure to attend conferences where on Saturday, for instance, the men who sell the goods get together and look over their week's work with the general manager, and canvass, as far as possible, the work for the coming week. This makes team work easier; keeps the office informed of the whereabouts of the salesman and makes it possible for them to co-operate and perhaps aid one another in landing the job, whether it be on a sewer contract or a new flat building.

The fact that new specifications and new styles and methods of finishing up a house are coming more in vogue all the time, makes it necessary for the modern salesman to be somewhat of a specialist. Therefore, there is greater need for a larger sales force and thus increased cost, and essential that the sales ledger should tell the exact cost of selling.

The second point is that when you have some-

thing new to sell, some new brand of cement even, you not only find it necessary to see the architect but the contractor and often times the owner, in order to secure recognition. This makes a lot of trotting around and adds to the cost of selling. But the other cost that enters so largely into the cost of handling material, that of docking, teaming and warehousing and then delivery on the job, can be responsible for the eating up of the profit or be reduced to the minimum, by introducing sensible economy in the handling of heavy materials.

The old hit or miss method of sending the team down to the dock with several men to unload a barge of sand is a thing of the past in these days of close competition and aggressive effort to increase the volume of business, and if the builders' supply man is up to date, he has a series of forms and a method of keeping track of his costs, that eliminates waste of labor in unloading, handling and rehandling, and delivering from dock to yard or from yard to building.

There are various methods employed, but we have been somewhat surprised to find that some of the most aggressive builders' supply men in the United States have no fixed method of discovering how much it costs to deliver a yard of sand or fifty barrels of cement or sixty-five 8"x16" tile, therefore the teaming and the handling charge is dumped into one item of cost. They know that feed costs more money; that the loss of a horse or two means a matter of \$300. They know that labor is \$2 to \$2.50 a day, and therefore is 33 1/3 per cent higher than formerly. They know in a general way that there is so much wear and tear on wagons or automobiles, but when it comes down to definitely knowing how much it costs a yard to deliver sand, they do not know it. When the price of bank sand is low at the bank and a two-horse team can haul four loads a day because of the accessibility of the bank to the yard or buildings, it is easy to divide the labor cost, but if no fixed sum is determined as to how much it costs to have a team on the street per day the builders' supply man is not in a position to determine how much he really should get for his sand on the job.

There are many items incidental to the handling of builders' supplies nowadays, and if the operator does not know his labor cost in handling; his office expense for taking care of the orders and getting the money; the sales department in getting the orders; his overhead charges and expense of employees in the way of salary, insurance and taxes, investment account and the like, it makes it easy for the demoralization of prices and thus keeps the builders' supply business in a chaotic state all the time.

It is the contention of ROCK PRODUCTS that every dealer should have an intelligent system of knowing how much it costs to do business every week, every day if possible, but at least once a month, and not be satisfied with the obsolete method of waiting until the end of the year to see whether their liabilities will be greater than they were a year ago and whether the money in the bank and accounts receivable and investments will pay the debts of the institution. ROCK PRODUCTS wishes to discuss this matter with the builders' supply men of the United States. We have secured some co-operation from the principal dealers, but the majority of them, either through lack of time or inclination, have not responded to the call for suggestions on the matter.

If the readers of ROCK PRODUCTS will make it their business to suggest a method or system of forms which will make bookkeeping easier and determine costs more quickly we will prepare a series of stories for the next several issues of the paper, and bring out the fact that you have been robbing Peter to pay Paul. As one dealer puts it: "We really do not know how much our teaming costs for cement, therefore if we only have 5 cents margin we do not know whether we have made any money on it or not. We do know that handling lime, cement and plaster and lath as well as other supplies that we made \$2,000 last year, but if we have any leaks in the handling of this material or if our prices are not high enough for certain kinds of this material we are handling, we really do not know it, because our system of bookkeeping does not keep us informed."

Several dealers have responded that they did not have up-to-date systems, but they would like to see ROCK PRODUCTS after conferences with various dealers in the trade, get out a basis and suggest forms that will make it easier to intelligently get at the minimum cost of handling and the maximum selling price for materials handled.

The Buffalo Crushed Stone Company has been incorporated at Buffalo, N. Y., with a capital of \$2,000.

RETAILERS.

Trade Conditions Found to Be Materially Improved in a Number of Cities.

ELYRIA, O.

Large manufacturing interests center in this live Ohio town. It has to its credit that during the period of depression none of its factories shut down and practically ran usual time. Prosperous conditions are seen here everywhere. Building operations are active and building material dealers are doing a brisk business. They report an ever increasing demand for cement coming from the surrounding agricultural districts.

E. C. & W. S. Griswold.

The brands of plaster of the Elyria Plaster Co. are handled by E. C. & W. S. Griswold. They have been branching out in many directions since last fall, including an increase in their traveling sales department, which will take in much new territory this year. Prices are taking an upward turn and business is fast resuming the healthy condition which existed prior to the depression of 1907. The special brands handled by the Griswolds are the Elyria wood plaster and the Elyria cement plaster. The field of their operations extends into Michigan, Indiana, Ohio, Illinois, Washington and Texas.

Elyria Concrete Co.

Under this firm name on Maple street W. S. & E. C. Griswold and C. W. Wales manufacture everything in the line of concrete. They are designated as manufacturing contractors, doing extensive work in reinforced concrete construction, laying street pavements, curbing, sidewalks, foundations and bridges. The company was kept very busy last spring and expects it will have all it can possibly do this fall. The territory in which it operates is by no means confined to this county.

Elyria Coal & Sewer Pipe Co.

Twenty years ago E. F. Sanford established this company's yard at the corner of North and Chestnut streets. It is one of the largest and best arranged for handling building material in the county. A switch track from the L. S. & M. S. R. R. runs through the yard close to the warehouse which has ample storage capacity for all the lime, cement and plaster handled. Lehigh and Diamond Portland cement and Speed's Louisville Hydraulic cement, lime in barrel from the Kelley Island Lime & Transport Co., plaster from the United States Gypsum and American Gypsum companies; sand, gravel, sewer pipe and a full line of clay products, including drain tile, flue lining and wall coping from the Robinson, Clay Product Co., complete the line of builders' supplies sold at this old and well-known yard. Mr. Sanford, its owner, manufactures concrete blocks, using the entire output of 300 blocks daily for foundations, cellars, etc., being a heavy contractor for everything in the concrete line. Mr. Sanford reports business good this year, and believes very bright prospects are ahead.

Elyria Lumber & Coal Co.

The lumber and coal yard of this company was established eight years ago at Chestnut street and the L. S. & M. S. tracks. Five years ago it began handling Alpha cement. Its sales have increased rapidly every year, making it necessary to build a warehouse of 1,500 barrels capacity to supply the constant demands from city and farming districts. In these latter the use of cement has been astonishingly large this year. The company also manufactures concrete blocks, its output exceeding three hundred a day. These blocks are much in demand for foundations and buildings. Charles J. Crehore, manager of the company, says the trade in cement has been good last spring, and he believes it will be even larger in the fall.

Lagron Coal & Supply Co.

A few squares from the business and residence districts and on the line of the L. S. & M. S. the yard of the Lagron Coal & Supply Co. is conveniently located, both for city and country trade. A. T. Lagron, proprietor for the last three years, has made many improvements in building new bins and enlarging the warehouse, which now has a storage capacity of 1,000 barrels of lime, cement and plaster. A switch track from the railroad runs alongside the yard and with convenient driveways provides for economical handling of these materials. Castalia cement, hydrate and bulk lime from the Kelley Island Lime & Transport Co., and the Woodville Lime & Cement Co., hard wall plaster from the Cleveland Builders' Supply Co., the American Sewer Pipe

Co.'s product. Sand and gravel are handled in large quantities. The demand for cement from surrounding districts has been much heavier than last year, and business has been very good this year.

City Fuel & Supply Co.

John Murbach, who for years has been the leading jeweler in Elyria, four years ago started a coal and builders' supplies yard at Cedar street and the L. S. & M. S. R. R., and it is now a money-making business. The yard is one of the best equipped in the state. It has a switch track, giving fine shipping facilities. The warehouse, standing close to this track, has in storage for immediate demands 500 barrels of lime, plaster and cement. Medusa cement, lime in bulk and hydrate from the Kelley Island Lime & Transport Co., the United States Gypsum Co.'s plaster and sewer pipe from the American Sewer Pipe Co. are handled. Much of the cement is sold to farmers in the vicinity of Elyria, who use it for making improvements on their farms. "My trade in the farming districts is rapidly increasing," said Mr. Murbach, "and business in general has been good and all indications point to exceedingly busy times in building material lines this fall." The office of the City Fuel & Supply Co. is at the corner of Broad and Middle streets.

BUCYRUS, O.

Bucyrus enjoys to the full the prosperous condition of the farmer, whose crops last year were plentiful and profitable. The farming districts here are using great quantities of cement for improvements, not only on the farms, but on roads and for bridges across streams. The dealers in builders' supplies all had a good business last fall and feel that the present bright prospects can be depended upon.

W. M. Read.

W. M. Read, on Railroad street, deals in grain, feed and hay and his side line is builders' supplies. The elevator which he uses for his general business and storing cement, lime and plaster years ago stood at the old Pennsylvania freight and passenger depot which he had helped to build in 1852. Mr. Read has been in this business for over half a century. A switch track from the Pennsylvania line runs alongside the elevator convenient for unloading from cars into elevator and warehouse. The latter has a storage capacity of 1,000 barrels of cement and lime. Mr. Read handles Atlas Portland cement, plaster from the Grand Rapids Plaster Company and hydrate and sand from the Kelly Island Lime & Transport Company. His shipping and delivery facilities are excellent.

Mr. Read says: "Farmers are using cement much more than in former years. Last year I sold a farmer a lot of cement which he was going to use to put in a barn floor and also for a floor in his barnyard. In fact, the farmers around here are making nearly everything of cement which formerly was constructed of wood. Business has been good."

J. M. Smith & Fitzer.

J. M. Smith & Fitzer, dealers in grain and building supplies, who are located at East Rensselaer street, have been in business eight years. A switch track from the T. & O. C. railway runs into their yard and conveniently close to the warehouse to unload cement, etc., from cars without trucking. The storage capacity is 600 barrels. The principal brand of cement handled is the Castalia Portland; hydrate, the only form of lime they handle, comes from the Woodville Lime & Cement Company, and sewer pipe and fittings from the American Sewer Pipe Company. Drain tile and vitrified blocks for foundations they sell largely to the farmers.

"Business," said Mr. Fitzer, "has been just as good as last year and is commencing to show great activity."

White Lumber & Coal Yard.

The White Lumber & Coal Yard, established four years ago, also deals in builders' supplies. Its yard is located at 643 Middletown street. Two switch tracks run into the yard, one from the T. & O. C. and the other from the Pennsylvania railway, giving it excellent shipping facilities. The storage capacity of its warehouse is 1,000 barrels. It handles Utica Hydraulic and Universal Portland cements; the product of the Fishack Plaster Company; lime in bulk from the Ohio & Western Lime Company, and hydrate from the Woodville Lime & Cement Company. Also sand, sewer pipe and fittings, flue lining, etc., from the American Sewer Pipe Company.

S. S. White, secretary and treasurer, reports an increased demand for cement from farmers and that business has been fair and is fast improving.

NORWALK, O.

This city is one of the live towns in the north-western part of Ohio. There has been considerable building done this year, much more than last year. Dealers in builders' supplies are alive and aggressive, and carry large quantities of material to supply the demand from city and country within a radius of twenty miles. The neighboring farm districts contribute largely to the prosperity found in Norwalk.

Fred H. Smith.

Fred H. Smith, who is known as having the largest manufacturing monument establishment in the county, saw an opportunity of extending his field of activity by buying the business and yard of the Norwalk Brick & Stone Co. three years ago. Many improvements were made in the yard, so as to handle material more economically and promptly. The warehouse was enlarged in storage capacity, to meet the demand which rapidly increased under Mr. Smith's energetic business methods. A switch track from the L. S. & M. S. railway passes close to the warehouse. Castalia, Lehigh, Atlas and Edison Portland cements; United States Gypsum and American Gypsum Co.'s plasters; sewer pipe from the American Sewer Pipe Co.; sand, gravel and concrete blocks are handled in this yard in large quantities. The output of concrete blocks which are manufactured in the yard has exceeded 27,000 blocks this year. Sandstone flagging for sidewalks and all kinds of stone cutting for building work is supplied. Mr. Smith said: "I have done a rushing business this year, and have every reason to believe that 1910 will exceed in volume that of any year in the last ten."

Mead & Woodward.

Mead & Woodward, at the corner of Seminary and Linwood avenues, have been in business in Norwalk fourteen years, dealing in grain, seeds, coal, lime, cement and plaster. The firm owns grain elevators at Collins, Woodford and Norwalk. It handles Diamond Portland cement, hydrate from the Woodville Lime & Cement Co. and the United States Gypsum Co.'s plaster. Its trade in these materials is large and increasing every year; especially is this so concerning the demand for cement in the neighboring agricultural districts, which has been double that of last year. Mead & Woodward are among the leading firms of the town who report conditions in business satisfactory.

F. A. Jenkins & Co.

F. A. Jenkins & Co., at 25 Whittlesey avenue, established thirteen years ago, are dealers in builders' supplies and heavy shippers of hay and grain in carload lots. They handle Castalia Portland cement, hydrate from the Kelley Island Lime & Transport Co.; the Fishack Plaster Co.'s product, and vitrified blocks used for foundations in buildings. Business has been steadily increasing and they believe the business will the coming season far exceed that of any previous year.

Henry Bremser.

Henry Bremser, manufacturer of concrete blocks and everything else cement will produce, has a yard at Woodland and East Water streets, with a switch track running into the yard from the Wheeling & Lake Erie railroad. He supplies the town and surrounding country with coal and builders' supplies. His specialties are Medusa Portland cement, lime from the Woodville Lime & Cement Co., the Michigan Plaster Co.'s product, sewer pipe from the American Sewer Pipe Co., crushed stone and sand. His output of concrete blocks exceeds 6,000 blocks a month. Mr. Bremser has lived here seventeen years, and is doing a good business, which is growing rapidly under his careful and conscientious methods.

Jos. Frey.

Jos. Frey is one of the live business men of Norwalk who has supplied this community with ice, coal and wood for the last seventeen years. His yard is large and having space to spare he put in a line of builders' supplies seven years ago and is doing a brisk business. He handles Alpha Portland cement, lime in barrels from the Kelley Island Lime and Transport Co., crushed stone, sand and gravel. The yard is admirably arranged for handling these materials economically and promptly. The demand for cement has been much larger than in any previous year. Also the use of concrete blocks for foundations and superstructures, which he is manufacturing. A 2-story building was erected last summer in which over 10,000 concrete blocks were used. Mr. Frey said: "Business has been only fair, but the future looks good to me." His office is located at 51 Benedict avenue.

CEMENT

CEMENT PRICES.

Portland cement continues to improve in price right along and by fall we expect to see the price back to where it belongs. The increase is the natural result of the increase in consumption. The following from the Wall Street Journal of New York is apropos at this time:

With an increase in the current volume of cement sales, an advance in prices is not at all unlikely in the near future. Prices have already advanced in the South and West, where conditions are better than in the East.

An improvement in cement prices will be gladly welcomed by all interested in the industry. The average selling price for more than a year has been below the actual cost of production. Present quotations covering the Lehigh Valley district, and mills of a more easterly location, are from 45 to 80 cents a barrel in bulk at the mill. Just what the proposed increase will amount to has not yet been definitely decided upon, but a maximum of \$1 a barrel would seem justifiable, considering present conditions.

The eastern mills have not been able to advance their prices like those in the West and South because of keener competition and because the volume of business is not as great in proportion to the output as it is in the West. However, from the tenor of the remarks made by representatives of various eastern mills while in attendance at the recent Chicago convention, it would seem that prices would shortly take a decided upward turn.

There is an immense amount of cement being sold through the regular dealers of builders' supplies in the various cities, which is being used in small construction work and on the farm. The comparative absence of any very large projects makes this small business loom up big. A sales manager of one of the large eastern companies said that the volume of small sales was greater this year than ever before. He said the farmer was using more cement this year than ever. A great deal of this cement is sold in very small lots.

The farmer is using cement in a multitude of ways and greedily absorbs all the cement literature sent to him. The work being done by the United States Department of Agriculture and the farm journals is having its effect. A great many up-to-date farmers are subscribing for the concrete journals and Rock Products has for some time past noticed an increased demand for the paper in rural districts.

KOSMOS PLANT BUSY.

Louisville, Ky., June 16.—O. M. Timmons, sales manager of the Kosmos Portland Cement Company, says: "We have just landed a 6,000 barrel order for the Hamilton bank job at Chattanooga, Tenn. We shipped forty cars of Kosmos last month to Memphis; we also have a contract for a thousand barrels or more for Stuttgart, Ark. We have landed several big jobs in the South. The demand for cement seems to be increasing. Prices are advancing and we look for much higher prices than at present. We are running full capacity."

ATLAS WHITE NOW ON MARKET.

"Atlas White" is the name of the new white Portland cement now marketed by the Atlas Portland Cement Company, New York. The company has sent out notices to the retail trade that it is ready to make shipments on this product and guarantee it to be fully up to the high quality of the Atlas brands.

INCREASE CAPACITY.

The new mill of the Universal Portland Cement Company at Buffington, Ind., will be a 12,000 barrel mill in place of a 6,000 barrel mill, according to a recent decision of the officials of that concern. Early in the year it was decided to add 6,000 barrels to the great Buffington plant, but before the arrangements were all completed it was found that it would take an additional 12,000 barrels to take up their needs. This will make a total capacity of 25,000 barrels per day at the Chicago plant, or a total of 40,000 barrels of cement per day of the Universal brand.

The board of directors of the American Cement Company, Philadelphia, Pa., will meet early next month to act on the semi-annual dividend payable in July.

MANUFACTURERS

Of Portland Cement Meet at the La Salle Hotel, Chicago, in Semi-Annual Convention

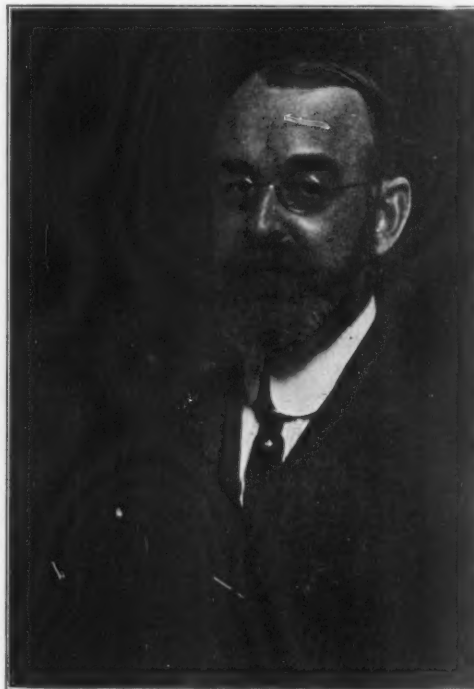
—Trip to Buffington and Gary

a Feature of the Entertainment.

The Association of American Portland Cement Manufacturers held its semi-annual meeting at the Hotel La Salle, Chicago, Ill., June 13, 14, 15. Almost all of the companies belonging to the association were represented. Although it has been some time since the association has met this far in the West, and there was some doubt as to the wisdom of the venture, the meeting was in every way an unqualified success. It proved that the West is becoming such a great factor in the manufacture of cement that at least one meeting each year should be held either in Chicago or some other point.

The annual meeting will always be held in New York in December, and the next meeting was fixed for December 12, 13, 14, at the Hotel Astor. The last day of the meeting will mark the opening of the Cement Products Exhibition Company's inaugural cement show in Madison Square Garden.

All of the meetings were fraught with interest and enthusiasm. It was the first meeting in several years where the optimistic feeling ran high,



W. S. MALLORY, PRESIDENT, ASS'N OF AM. P. C. MFRS., STEWARTSVILLE, N. Y.

the few pessimists at the meeting were pretty badly treated.

The members were entertained royally by the local cement companies' representatives. A feature of the meeting was the trip to Buffington and Gary the day following the sessions.

The first day of the meeting was given up to the sales managers' branch of the organization.

A. H. Craney, Jr., of St. Louis, is the president of the organization.

He called the meeting to order at 2 o'clock in the afternoon of the first day and found quite a fair representation present. Among the absentees noted was Charles L. Johnson, the secretary, who was unable to be present owing to a pressure of business. The regular routine of business was transacted and the meeting adjourned to meet next December, when the regular association holds its annual.

The executive committee of the manufacturers' association met at night.

Tuesday marked the opening of the regular sessions of the association. The regular order of business was taken up with W. S. Mallory, the president, in the chair, and Percy H. Wilson recording. The reading of the minutes was followed by the reports of the officers and reports of the various committees. The report of the committee on publicity, of which Albert M. Moyer is chairman, was listened

to with a great deal of interest. The work of this committee has enlisted the most favorable comment from the association. It is doing a great work. Few members of the association realize the scope of its efforts. The results are already being felt and are very gratifying and reflect great credit upon Mr. Moyer and his co-laborers. The committee is now at work getting out a bulletin on concrete telephone and telegraph poles.

A discussion of trade conditions in general followed. This brought out the fact that the great majority of the companies are rushed with business and that while there are no great number of large projects, the immense number of smaller operations has made up the deficiency and the demand is stronger today than it has been in several years. The general consensus of opinion is that this year will be one of the best in the history of the industry.

Without any concentrated effort on the part of the manufacturers, the prices of cement in nearly every section of the country have been advanced. In this connection the fact was brought out that the eastern companies have not been able to advance their prices quite so rapidly as in the West, showing that the demand in the middle West and the South and Southwest is especially active.

The second day's session was given over to the reading of papers by various machinery experts and proved to be very interesting. The great question concerning the manufacture of Portland cement in this country today is the economical grinding of the materials. This is really getting at the heart of the business. There has been too much taken for granted in the past and too much heed has been paid to promoters of cement companies. Statements have been made regarding the cost of manufacture which have gone unnoticed too long. The manufacturer of Portland cement is beginning to realize that the figures given out by so-called experts on the cost of the production of cement have been far too small, the actual results disproving these statements. Nearly all of the grinding and pulverizing machinery representatives were on hand.

The meeting was called to order by W. S. Mallory, the president, who made the announcement that on the following day the entire association had been invited to go to Buffington and Gary as guests of the Universal Portland Cement Company. This invitation was accepted with enthusiasm. The first paper called for was that of the Allis-Chalmers Company. Paul C. Van Zandt, representing the Allis-Chalmers Company, read the following paper:

ALLIS-CHALMERS METHODS.

By Paul Van Zandt.

It is rather difficult to go very deeply into the subject of grinding machinery in so short a time and in order to get to the special features which I hope will be found interesting to this association I am going to commence on the assumption that everyone here is familiar in a general way with the grinding machinery which has been manufactured by Allis-Chalmers Company for so many years and so universally and successfully used.

Gyratory Crusher.

This is the first machine used in reducing rock for the manufacture of cement in nearly 95 per cent of all the rock plants operating in the western hemisphere. There is no other type of machine competing with this type that I know of.

It has been my observation that when any type of machine is really as much better than all other types competing with it as the machinery manufacturers try to make prospective purchasers believe, that it actually replaces all these other machines in practice in a remarkably short period of time.

The gyratory crusher is an example of this rule, as is also the large kiln, the rotary cooler and a few others.

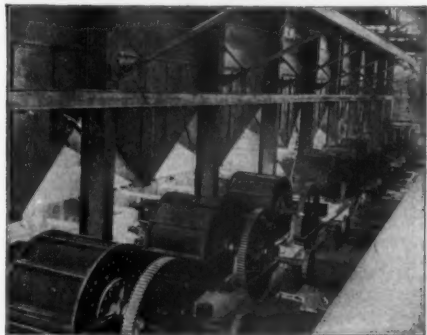
I will not, therefore, spend any time in telling the merits of this type of machine, as the only thing that is new and of interest is the announcement of the larger sizes that are now being built.

These machines are now being made in the following sizes: No. 18, with two openings, 36"x90", and No. 21, with two openings, 42"x108", and the No. 24, with two openings, 48"x124". These machines are of enormous size, the largest that can be shipped upon railroad cars and, in fact, we had a special well built car to transport the top shell to avoid the necessity of splitting it in halves.

There are a number of cement plants using these large crushers to advantage. They are intended for use with large steam shovels and make a very considerable saving in quarrying cost, eliminating practically all hand sledging and saving considerable powder, not to mention the increased capacity of the quarry with the same or less available working force.

We have developed a new preliminary grinder in the ball tube mill which is as simple and has as low an attendance and maintenance cost as the tube mill. It is like a tube mill 7' diameter x 7' long, feeds and discharges through hollow trunnions and charged with ten to twelve tons forged steel balls. The machine has a wonderful capacity, being a thousand barrel unit, grinding a thousand barrels of clinker from kiln size to all through 20 mesh in twenty-four hours.

The principle involved is that of crowding the material through the mill, screening out the fines, returning the coarse for regrinding, thus keeping the heavy hard steel balls working on coarse material without the mixture of considerable amounts of fine material to cushion the blow. The screening is done in Newaygo screens above the mill and the screened material is carried on to the



ALLIS-CHALMERS BALL MILLS AT UNIVERSAL PORTLAND CEMENT COMPANY'S PLANT.

tube mills by conveyors without the necessity of being elevated in a second elevator.

Tube Mill.

The tube mill is continually meeting new competition every year, but the total competition of different types of fine pulverizers remains about the same. The use of tube mills seems to be slowly increasing year by year and the machine seems to have a slight advantage in the long run for all comers.

Illinois Steel Company Tubes.

We are now building tube mills 7' and 8' in diameter and 24' in length. The capacity increases in proportion to the increased area, on the basis of 500 barrels per day for a 6' mill, the 7' should do about 680 barrels and the 8' about 890 barrels. Capacities of all machines vary between wide ranges and we have no data on the 8' mill as yet, but we are rapidly approaching a thousand barrel unit in this machine, so that the plant of the future using a thousand barrel mill can be built with only one machine in each department for every thousand barrel capacity. The elimination of the large number of small units in designing new plants has been going on for a number of years, and I believe the use of large units as above described to be the logical outcome. A large machine requires approximately only the same amount of attendance, repairs and maintenance as a small one, and less initial expense; smaller buildings can be erected and put into use quicker than the equivalent number of small machines, produces cement cheaper, and actual practice shows it to be at least as reliable in continuous operation and freedom from shutdown as evidenced by monthly records of output and mill hours operation.

We are building tube mills with two or three new forms of linings which possess considerable advantage in cheapness in wear per barrel cement produced and considerable novelty. One of these linings of cast iron has ribs which catch the pebbles and hold them in place so

that the wear is taken by the pebbles themselves, and when worn they are automatically replaced by new ones in the operation of the mill itself. Another is a series of V-shaped corrugations in a cast iron lining, making it like a cylindrical accordion. The larger pebbles wedge in the bottoms of the V's and the mills now in use indicate an increased capacity with a decreased horsepower.

Ball Mills and Motors.

In the speaker's opinion by far the greatest advance in cement machinery is the development of a cement mill motor especially adapted to driving individual grinding machines. One of the commonest of troubles in starting a new plant or installation is the failure of the motors to properly start or run the grinding machines to which they are attached. The primary cause in most cases is the underestimating of horsepower by the manufacturer of the grinding machine, who guarantees power required, to be less than it sometimes actually takes. The common rating up of motors to the ultimate power they will deliver and "then some" is an occasional cause, which combination of a machine requiring more power than is supposed and a motor not delivering the power at which it is rated, will frequently get the most conservative purchaser into trouble. I can cite a dozen or more cases such as a machine supposed to take 100 horsepower and actually taking 187, another to take 40 horsepower and actually taking 75 and so on, while a 110 horsepower motor is a 100 horsepower rated up and an 85 is a 75 rated up, etc.

Nor can the manufacturers of grinding machinery be blamed for this, as the same machine frequently takes more horsepower on one material than another, and one clinker than another. They are frequently operated at different speeds and in different manners and made to grind to different degrees of fineness. If at one plant the power consumed is greater than several others it is not the fault of the machinery manufacturers but the misfortune of the cement plant. All representatives of electrical houses are not familiar with cement plant loads either, and these high starting overloads and heavy twenty-four hour consumptions of power are unusual in the manufacturing arts as a rule.

The average motor is made to meet average conditions, not exceptional ones.

On the basis of the above we have developed special cement mill motors adapted to various machines used in the industry and are prepared to give guarantees with our own machinery (when we are in possession of all the facts) that our motor will start and drive the machines properly for the manufacture of cement, without any whys and wherefores such as "provided materials are of average grindability," etc. So far as I know the Allis-Chalmers Company is the only concern that has really made good on horsepower guarantees. Between the grinding machinery manufacturers and the electrical company the cement company usually holds the bag, but the Allis-Chalmers Company, as a manufacturer of both, is not in a position to squirm out. Better than all that, however, is the fact that we now know in advance how not to get into trouble, which is what we all want.

The motors used for these drives are built on a frame size larger than the rating instead of smaller, so that a 115 horsepower motor is made on a 150 horsepower frame and a 160 horsepower motor on a 200 horsepower frame, etc. This liberal frame size, coupled with special starters and rotor construction gives the motor the large overload capacity to start without the excessive drain on the line current necessary in standard motors of same frame size.

They are then rated down to the power actually taken



ALLIS-CHALMERS TUBE MILL AT UNIVERSAL PORTLAND CEMENT COMPANY'S PLANT.

by the machine so that in continuous operation they are developing best efficiency and power factor.

At the conclusion of the reading of this paper Mr. Van Zandt was plied with questions by the wholesale. It is seldom that a representative of a machinery company gets an opportunity to talk to so many interested parties at one time. Although the questions were rather difficult, Mr. Van Zandt acquitted himself with much grace.

George H. Fraser, of the Kent Mill Company, then read a paper on Kent mills, which was well received.

THE KENT MILL.

By G. H. Fraser, Kent Mill Company, New York

You are familiar with the principles of the Kent invention and with the construction of the Kent mill and with its use as a cement grinder, all of which were discussed when I previously had the honor of speaking before you.

The Kent Invention.

Suffice it to say that the Kent invention included a revolving ring, internal yielding reacting crushing rolls, and any means for driving the ring or rolls, the material being crushed against the inner face of the ring by the outward pressure of the rolls, which were adjustable to any pressure necessary to crush the material.

This construction utilized centrifugal force for holding the material on the face of the crushing ring, thus dispensing with plows or scrapers, and making it possible to maintain such a depth of material between the crushing faces that only the surface particles could abrade on the wearing parts, the major portion of the material abrading on adjacent particles of material during the crushing action, thus reducing wear to the minimum for the work done.

Previous Grinders.

Prior to the Kent the following mills were used for pulverizing:

The buhrstone, which ground solely by friction; The pusher mills, in which a number of balls were pushed around in a mass of cement within a fixed die, which ground both by friction and pressure; The suspended roller mill, in which the gyratory action of a swinging roll against a stationary die ground the material by concussion; and The tumbler mill (either ball or tube), in which a great mass of balls or pebbles and the material tumbled in a revolving cylinder by continually lifting above the angle of flow.

The Kent Objects.

The Kent invention aimed to avoid the disadvantages incident to these earlier methods. Some of its objects were to avoid breakage, noise and vibration, and to secure greater reliability, ease of manipulation, and facility of renewal; but its principal objects were to increase capacity per unit, to save wear-cost per output, and to reduce power per production, to nearly the theoretical minimum necessary to overcome the crushing force of the material, and to bring grinding cost to the irreducible minimum.

It aimed to supply a 1,000-barrel unit, only six feet square, and weighing only 10,000 pounds, and yet having more capacity than many buhr mills, or several pusher or roller mills, or even the largest ball mill, and which would grind without wasting any power in needless friction or unnecessary foot-pound lift.

It aimed to utilize all the forces of action and reaction as effective elements in crushing, and to the conservation of energy.

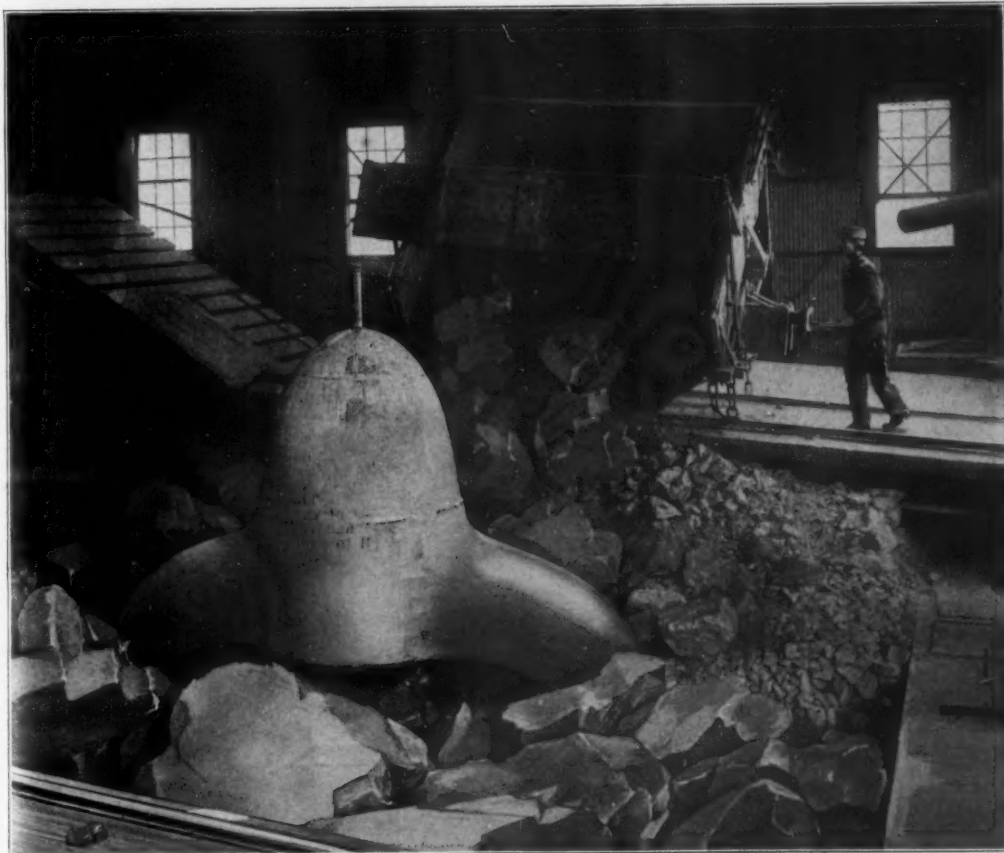
How well its objects were attained in practice is shown by reports from users of the Kent mill for preliminary grinding of rotary kiln Portland cement clinker as feed for tube mills.

For example, one manufacturer, after using its first Kent mill over five months, writes as follows:

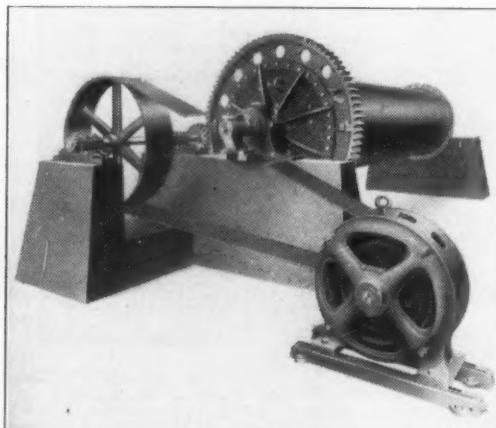
Sandusky Portland Cement Company,
Sandusky, O., Feb. 12, 1904.

Kent Mill Company,
170 Broadway, New York.

Gentlemen: Replying to your inquiry of the 6th, would say that we have obtained very satisfactory results with the Kent mill we installed last autumn at our factory at Syracuse, Ind. We used this mill as preliminary grinder for Gates tube mill, in connection with a Columbian separator. We found the mill to require 24 horsepower, and to do nearly as much work as four ball mills, requiring 40 horsepower each. The mill ran night and day for three months, grinding certainly more than 1,200 barrels of clinker each 24 hours, as it comes from the kilns (cold), to



NO. 18 GATES BREAKER, TWO ARM SPIDER.



MOTOR DRIVEN TUBE MILL.

all pass 20 mesh. Use of the Kent mill increased the output of our tube mills from 14 barrels to 18 barrels per hour each. After 90 days' service we turned up the rolls and tire of the mill, and it has since been running 60 days with as good output as at first. We expect that this mill, with the additional one lately received from you, will easily take care of 2,000 barrels clinker per day, allowing abundant time for necessary repairs. Our superintendent estimates that one set of tire and rolls will stand three turnings, and will thus last one year.

Hoping that this information will be what you require, we remain, Yours very truly,

Sandusky Portland Cement Company,

(Signed) S. B. Newberry, Mgr.

Power Actually Consumed in Crushing.

Another manufacturer, the Chicago Portland Cement Company, using many Kent mills for similar work, writes us that there is only 16 horsepower difference between running the Kent mill loaded to its maximum capacity and running it empty.

Highest Output Recorded.

From another cement plant, that of the Northwestern States Portland Cement Company, on similar work, we learn that the new Maxecon unit of Kent mill attained a capacity of 52 barrels per hour, with prospects of doing even more.

Conclusions.

From such reports it might be fairly deduced that the Kent mill is capable of constituting a 1,000-barrel preliminary grinder in a 1,000-barrel unit; also that the power actually consumed in the crushing of the clinker is approximately 16 horsepower (i. e., the difference between running the mill at its maximum capacity and running it empty), and that the total power for operating and crushing should approximate 24 horsepower.

Therefore it may be said that all power above 24 horsepower used to drive any 1,000-barrel unit in crushing clinker to 20-mesh is lost in unnecessary

friction, shock or foot-pound lift, or is otherwise misapplied or wasted.

Anti-Frictional Principle.

While the Kent ring and rolls resemble a ball bearing and should operate empty with no more than a mere theoretical power, it is possible to apply pressure to them up to the brake limit, and thus increase the power consumed in mere operation from the 8 horsepower arrived at as the typical power for operating at this work by deducting the 16 horsepower, actually consumed in the crushing, from the 24 horsepower which Mr. Newberry has required for running the mill and accessories while grinding feed at the rate he states.

In rare instances it has been said that the old Kent mill and its connections, when loaded, consumed from 8 to 24 horsepower, but this wide variation is explainable by the fact that the old Kent mill, having two driving pulleys, as against the one pulley of the new Maxecon mill, made it possible that variations in diameter of the driving pulleys resulted in proportional loss in the driving shaft, a feature entirely obviated in the Maxecon mill by the use of a single driving pulley.

Assuming a capacity only 40 barrels per hour, and 16 horsepower for the actual grinding, the power necessary to crushing the clinker to 20-mesh may be taken as two-fifths of 1 horsepower per barrel, and that for running the mill when doing such work as one-fifth, making a total of three-fifths horsepower as the possible power cost of reducing clinker to 20-mesh for tube mill feed by the Kent mill.

As in the case of the Sandusky statement this included everything from the time the clinker left the clinker bin until the feed was sent to the tube mills, it is fair to assume that any further expenditure of horsepower for this work is unnecessary.

Fineness of Product.

It has been asked if in the light of the great capacity of the Kent mill the percentages of fineness in its discharge compared favorably with those of other preliminary grinders, and also if fineness is sacrificed in attaining greater capacity? The answer is that the percentage of fineness in Kent mill product is probably higher than that in the discharge of any other preliminary grinder, and that even at the greater capacities these percentages are but slightly changed. For example, referring to instances before quoted, we find from the fineness tests made by Mr. Reilly, of the Sandusky company, that the ground clinker from the Kent mill ranged as follows:

Ninety-eight and five-tenths per cent of the total passed a 20-mesh sieve.

Forty-nine and five-tenths per cent of the total passed a 100-mesh sieve.

Thirty-five per cent of the total passed a 200-mesh sieve.

And in the case of the mill run at 52 barrels per hour that

Ninety-eight per cent of the total passed a 20-mesh sieve.

Forty-seven and two-tenths per cent of the total passed a 100-mesh sieve.

Thirty-two and four-tenths per cent of the total passed a 200-mesh sieve.

Thus it will be seen that of the discharge of the Kent mill almost half passed 100-mesh, and about one-third of the discharge passed 200-mesh, and that the percentages of fines when grinding approximately 40 barrels per hour were slightly higher than when grinding over 50 barrels per hour.

These large percentages of fines easily explain why tube mill capacity increases with Kent mill feed.

Finer Tube Mill Feed.

Kent percentages of fines have suggested the advantage of finer preliminary grinding, and some users are grinding

their feed to 98 per cent 30-mesh, and consider the results highly advantageous. The percentages of fines in Kent mill discharge on this work will interest you in comparison.

We cite the following example recently received from a plant in which four Maxecon mills are grinding rotary clinker to 98 per cent 30-mesh as preliminary feed for six tube mills, each 6 feet by 21 feet.

The product from the Kent mills screened as follows: Ninety-eight per cent of the total passed through a 30-mesh sieve.

Fifty-nine per cent of the total passed through a 100-mesh sieve.

Forty-two per cent of the total passed through a 200-mesh sieve.

From this there will be noted a great gain in the percentages of fines over that found when grinding the feed to only 20-mesh. In connection with these mills it is estimated by the engineers that while the average hourly output of the tube mills was then only 21.5 barrels each, this would be increased, and we quote their language as follows:

"The Kent mills and tube mills were running on clinker fresh from the kilns. With clinker which is weathered, the tube mills will turn out about 27 barrels per hour each, and the Kent mills a corresponding amount, so that four Kent mills will take care of the output of six tube mills."

A feed capacity at the rate of 45 barrels per hour was attained at this work, but the sustained rate is under 40 barrels.

By reason of the great gain in fineness of the tube mill feed and in tube mill output when the preliminary grind has such large proportions of fines, we are impelled to suggest that, instead of aiming at units of 1,000 barrels per day 20-mesh feed, the ideal solution of the clinker grinding proposition would be a mill to grind to 98 per cent 40-mesh or even 50-mesh, both of which are quite as feasible screening sizes as are 20 or 30-mesh, and that such preliminary installation consist of a Maxecon mill, a short elevator and a Perfectecon separator, to feed each tube mill. We believe that with such a preliminary unit a capacity of 30 to 40 barrels per hour could easily be produced with an expenditure of from 25 to 30 horsepower, and with such fineness of feed the work of the tube mill would be so accelerated that it should attain a capacity exceeding 40 barrels per hour of finished cement.

Such units disposed side by side, with bins so arranged that any element of any unit could feed or take from any element of any other unit, would be an ideal solution of the question of low cost, easy operation, sustained production, and the highest degree of fineness. With it any element could be overhauled by simply switching a spout and closing the feed gate, so as to transfer the work to adjoining elements, and the operation of the whole would be uniform, continuous and exceedingly simple.

Outside Separation.

The advantages of screening the product outside of the mill instead of within are being more generally recognized each year, and this method is now advocated by the most advanced manufacturers of mills. The Kent Mill Company was the first to strongly advocate this principle, and it has proved economical and advantageous since it enabled the grinder to be relieved of the fines as fast as made and avoided any waste of horsepower or wear on fines, permitting the mill to utilize all its force in the reduction of the coarse material, and insuring against the clogging or puncturing of internal screens. The separate outside screen made it possible to utilize and install as much screen surface as is requisite to handle the maximum capacity of the mill. In addition it insures long screen life, easy accessibility and renewal, and avoids any necessity for stopping or opening up the mill except when actual renewals therein are required.

The operation of a Kent mill is based on the assumption that it will be used in connection with an outside separator, usually an inclined screen. There are many of these, but that generally used with the Maxecon mill is the Perfectecon separator.

This is built with 60 square feet of screen surface, so that one may be large enough for a Maxecon mill when working at maximum capacity. The Perfectecon separator has a sectional inclined screen which is positively vibrated with an upward jolt and a slow reverse, so that the sharp particles are lifted out of the meshes and the screen cloth kept clear. These jolts are distributed throughout the surface of the screen, and range from 200 to 400 per minute, but the motion of the screen surface is so slight, and the reverse of motion so graduated, that the life of the screen is not impaired while its efficiency is fully maintained.

Grinding Finished Cement and Air Separation.

So far our remarks have applied to preliminary grinding, but that the Kent mill is not limited to this one field is evidenced by the high percentages of fines before noted existing in its discharge. Its value as a grinder of finished cement has been evident to the many who have studied this phase, and great success has been attained with it in this direction.

Both in this country and abroad it is extensively used in connection with air separation, and it seems evident that eventually one of the principal uses of the Kent will be for so making finished cement, thus eliminating the tube mill.

Results on Finished Cement.

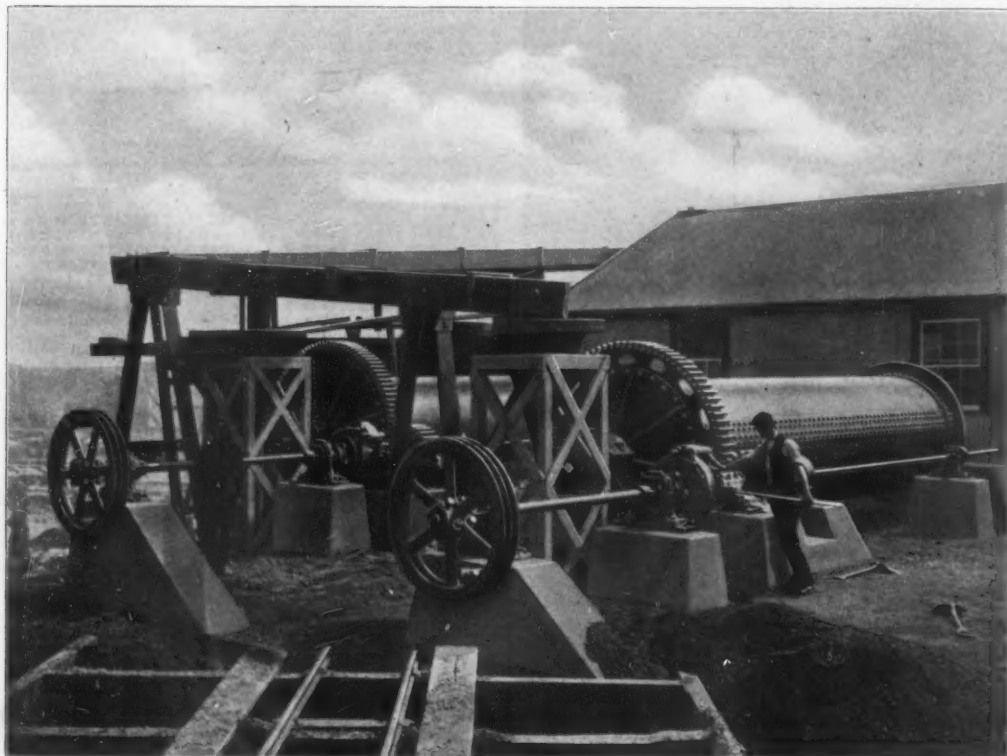
Some results attained by this process may interest you, and hence we give some data taken from recent reports, both on raw material and finished cement, by which horsepower and production may be estimated.

One Portland cement plant, using Kent mills and air separators in its clinker and coal departments, reports on finished cement a yearly average of "from 9 to 12 barrels per hour per mill, all above 95 per cent and average 96.2 per cent to pass a 100-mesh sieve. The 200-mesh sieve gives about 83 per cent."

On coal grinding it reports 3 tons of coal per mill per hour.

The horsepower for the coal grinding plant, which consisted of one "Williams mill, one 50-foot Ruggles coal dryer, 5 elevators, 125-foot 12-inch screw conveyor, 3 Kent mills, 3 Emerick air separators, all necessary belting, etc., all driven by one motor, and only showed from 75 to 85 horsepower at the switch-board."

One explanation of this astonishingly low horsepower is that the power actually consumed crushing coal is very little owing to its low crushing force, and another



GATES TUBE MILL FOR WET GRINDING.

is that the power actually consumed in running the mill under such light work is nominal.

Results on Raw Material.

Another plant operating eight Maxecon mills with air separators on raw material, and eight grinding finished cement, reports:

"We have ground five tons of lime rock and fifteen barrels of clinker per hour per mill to the required fineness. We would, however, not consider it safe to rely on these figures for an average production, but may be able to obtain twelve barrels of clinker in a steady run.

"The motors used for the mills are 32 horsepower capacity and the tension on the mills is carefully set so as not to exceed this power by a meter reading. The elevators require 2½ horsepower and the separators (1 for 2 mills) 5 horsepower, or a total of 37 horsepower per mill."

Horse Power for Finish Grinding.

It may be deducted from these reports that in crushing, drying, separating and conveying the coal the total horsepower is under 8 horsepower per ton, and that in the grinding alone it is well below 4 horsepower per ton.

Assuming twelve barrels of finished cement per hour as ground and separated for each mill, and 36 horsepower provided, it may be safely estimated that the power per barrel for finishing cement with the Kent mill and air separator is less than 3 horsepower per barrel.

From the same reports the horsepower per ton for grinding and separating finished limestone may be approximated under 5 to 7 horsepower per ton.

Units of 250 barrels each appear best for plants in which the Kent mill and air separator are used to make finished Portland cement. Each unit is recommended to include a mill, elevator and separator; and the units should be disposed so that any part of either may serve any part of any adjoining unit, thus gaining the advantages above mentioned as to preliminary grinding installations.

For finished grinding on the raw end we suggest 100 ton units as the maximum, these each consisting of a mill, air separator and elevator, each unit being reciprocal to those adjoining as before explained.

For coal grinding 100 ton units could be best considered.

Breaking Before Grinding.

In limestone and coal plants breaking to pass a 2-inch ring should be provided for.

For the clinker since the Maxecon mill inlet is 6 inches by 7 inches, the clinker is fed as it comes from the kilns, using only a 2-inch grizzly to scalp out the large clusters, which one pot crusher or roll breaks for the plant.

When we find that in some instances there is expended 160 horsepower in producing about 40 barrels of 20-mesh clinker per hour, and when we consider the great expenditures of power in the frictional methods of grinding, it is most astonishing that, as our friends have shown us, only 16 horsepower is actually consumed in pulverizing the material, and that 24 horsepower has sufficed to do the same work. It seems so remarkable as to cause us to search for an explanation—to find how it has been accomplished—to explain the reason for this great difference and account for the wonderful saving. It is accounted for as follows:

Waste Eliminated.

The Kent invention eliminated foot pound lift by supporting the crushing members so there was no tumbling whatever, and by distributing material around the ring and thus maintaining a counterbalanced condition. It applied any desired crushing pressure by pressing the rolls against the ring with a force necessary to crush the material by sheer pressure. It utilized the toggle principle for the mutually approaching crushing surfaces, attaining the most favorable bite or nip. It eliminated all plows, fans, stirrers or lifters, by utilizing centrifugal force to hold the material in place to be crushed instead of to do the crushing.

Forces Harnessed.

In addition it so harnessed the forces of impact and shock that action and re-action were both entirely utilized in the work of crushing and consumed within the crushing members. Thus the shock against each roll was transmitted through it to the other, the pressure on each roll was distributed from it to the others, and the forces acting against the ring opposite any roll were transmitted by it to the other rolls, and the material disposed between the ring and rolls was subjected to all of the forces acting against either, so that these forces were absolutely consumed in the work of crushing.

The ring and rolls thus were essentially a ball-bearing or anti-frictional rolling device requiring no power to move except theoretically. When material entered between the faces the amount of power required was only that necessary to overcome its crushing force or to cause the parts to yield and pass it. Manifestly the mill should do the crushing with only the power necessary to overcome the crushing force of the rock, plus a small addition to overcome inertia, etc.

Thus we see that there is nothing mysterious in the wonderful power economy of the Kent mill. It simply conserves energy and utilizes action and re-action to the utmost and to the best advantage. It eliminates every unnecessary or wasteful feature and reduces the crushing members to four simple parts.

The shocks and pressure incident to crushing at one side of the ring are transmitted through the rolls and ring to the other side of the ring and there utilized as crushing force, instead of being transmitted to and wastefully consumed in rigid bearings. The saving in this respect will be appreciated when one considers the greater force required to roll a vehicle over a rough road than is required to roll it over a smooth track.

Nearly as wonderful as the power saving, is the wear saving effected by the Kent principle. As will be seen from the statement of the Sandusky Portland Cement Company, the four wearing parts of the mill, operating at a capacity of 1,200 barrels of clinker per day, had then, after more than five months' use, not been renewed, and were then deemed capable of lasting long enough to complete a full year's service before requiring renewal. Assuming this to be exceptional, and that six months' continuous service at this rate be taken as a basis for the life of the wearing parts on such work, and counting on semi-annual renewals of these, at a total cost of say \$300 per year, and allowing \$60 a year for incidentals, would give an upkeep cost of \$360 per year for the mill, which, if maintained at say a 1,000-barrel a day capacity instead of as estimated by Mr. Newberry,

would approximate a wear cost of less than one-tenth of a cent per barrel for the preliminary grinding of Portland cement clinker. We are disposed to again double this to provide for eventualities, and for ultra-conservatism to take as an estimate for wear and tear for this 1,000-barrel unit, one-fifth of a cent per barrel.

On the finish grinding of coal, of raw material, and of finished Portland cement, with the Kent type of mill, all our reports indicate a similarly astonishing wear economy, and cause us to estimate for grinding coal a wear cost of 1 cent per ton, for limestone a wear cost of 1 cent per ton, and for finished Portland cement a wear cost of one-third cent per barrel, as conservative approximates based on renewals required for such work during the past dozen years. These remarkable economies of the Kent mill in wear cost are conceivable through the foregoing explanations of its avoidance of friction, plowing and stirring, and of its principle of making the material abrade upon itself.

These features, coupled with the avoidance of breakage or crystallization by the complete cushioning of the crushing members, are forceful in explaining how the Kent mill has brought wear cost so near to the theoretical minimum.

The Maxecon Mill.

A recent embodiment of some of the Kent principles is found in the Maxecon mill, especially designed to meet the views of cement manufacturers. This grinder has swinging bearings supporting the shafts at both sides of the roll, which support is especially desirable in working under the tremendous strains and shock loads incident to a pulverizing unit of such large capacity. The bearings have perfected oil and dust provisions, insuring cleanliness and preventing waste. Solid connecting yokes preserve parallelism and alignment, and balanced caps provide perfect equalization in case of shaft flexure under the tremendous shocks when iron enters the mill.

Toggle joint connections for the bearings utilize the weight and inertia of these parts as grinding elements and permit the bearings to swing clear of the casing, making both sides of the mill immediately accessible.

This is an open side mill having covered openings larger than the ring, which part can be removed from either side. The top can be removed or can be lined up to increase wear range.

Universality in drive and feed is provided for by shifting the hopper from side to side or end to end and driving the pulley accordingly to fit any desired installation.

A single pulley, which may be run in either direction, provided its top turns toward the feed, simplifies driving and avoids all power loss which would be possible with the former two-pulley mill in case difference in diameter caused one pulley to pull against the other.

The capacity of the Maxecon mill has proven greater than that of the former type, its horse power per output is obviously less, and its maintenance cost lower. In addition to these advantages it possesses many minor features of importance to cement grinding, especially intended to facilitate upkeep and reduce stoppages, such for example as removable bearings bushings which can be slid out and replaced if necessary with but momentary stoppage.

Possible Production Economies.

Comparing the suggestion that 160 horsepower be expended to operate any mill as a 1,000-barrel unit, with our friends' statements of operating a Kent mill and accessories, as a 1,000-barrel unit, with 24 horsepower, indicates that in this respect there is a possibility of saving, say 136 horsepower on the preliminary grinding of each 40 barrels of Portland cement clinker, a saving of approximately 3.4 horsepower per barrel.

Deducting the wear cost of one-tenth to one-fifth cent per barrel, estimated from the results stated by our friends who are using Kent mills for this work, from the upkeep cost of other mills per barrel for similar work, might possibly indicate an equally surprising opportunity for economy.

Interest, taxes, depreciation and overhead cost generally, based on the difference in original outlay for the grinders themselves, for the heavy transmission connections, for the larger buildings and more costly foundations and connections, and the great difference in power plant cost, should all make a vast difference between one method of grinding and another, from which possibly a further material economy per barrel could be computed.

Since the question of economical production in cement is continuously becoming more prominent, it is thought that consideration of these possibilities will be both interesting and instructive at this time.

A Broad Invention.

The Kent invention was generic and revolutionary. It made the ring and rolls mill a practicable and valuable instrument in the art of grinding. That it was a remarkable advance is evidenced by its almost phenomenal economies in power and wear, and its wonderful advantages and increases in capacity.

The invention included departures from accepted theories in mechanics, and involved innovations in the utilization of forces, which but for its invention might not have been discovered for the benefit of mankind.

The Kent invention included the utilization of two or more rolls re-acting through each other and each against the material on the inner face of a revolving ring in such manner that the forces and shocks incident to crushing the material were consumed within the ring and rolls and utilized in the crushing work. It also included many features, principles and improvements, pertaining to ring and roll mills, and generic principles utilizing the crushing parts to themselves transmit from one to another the crushing forces, and utilizing one crushing part to support another crushing part against the crushing strain of a third crushing part by means transmitting such forces from one to the other.

It will be appreciated that these are very broad, novel principles, worthy of the most generic patent protection, and capable of utilization in whole or in part according to various modifications or adaptations without departing from the spirit of the invention. The former Kent mill and the present Maxecon mill will be understood to embody many features of this invention, and the principles of the invention being comprehended, it will be easy to detect any utilization of any part of it in any pulverizer.

Patent Protection.

In the light of the breadth and fundamental nature of this invention it will be interesting to know that it has been and is being made the subject of many claims for patent protection, and that it is thought that there can

be no opportunity for evasion of its patent rights, and that it is firmly believed that no infringements on such rights can be successfully defended, either against the provisions made or against those under way looking to the complete protection of the invention.

The Kent mill and the Maxecon mill are manufactured principally under the protection of the Kent patent No. 673,856, granted May 7, 1901, for the term of seventeen years. These letters patent contain twenty-six substantial claims so broadly covering many features of the Kent improvements that we do not believe that a mill of the ring and re-acting rolls type can be manufactured, sold or used without coming within the scope of the claims of that patent.

Understanding, as you all do, that it rests with the United States Court to say what is an infringement of a patent, you appreciate that since this has been decided by such court it remains for the patentee who believes there is a trespass on his rights to assert such belief and rely on the courts for his remedy.

Infringement.

Our patent laws provide for action against the manufacturer, the seller, or the user, in case of infringement, it lying with the patentee to proceed against any or all of these, and to seek redress by injunction, and an accounting for damages against the infringer, whether he be the maker, the seller or the user, if the court decides there is an infringement. Inventions of such great importance and advantage, constituting such a marked advance in the art, and being of such fundamental and generic nature, as are the Kent inventions, are generally viewed most favorably in litigation, and in such cases attempts at mere colorable evasions are not regarded in the same light as with inventions less generic.

"Patented."

One should not be influenced by the fact that any machine is marked "Patented," because under our patent law every slight change which in itself amounts to patentable invention is entitled to patent protection; but the fact that a patent is granted for this change does not entitle the patentee or others to infringe on any other patent.

History.

When embarking in manufacture and before acquaintance with our many customers, it was thought necessary to print in our catalog a formal notice:

"Notice is hereby given that the Kent mills are protected by the several Kent patents and by Mr. Kent's numerous applications for patents both in the United States and the principle foreign countries, and that all makers, users or sellers of mills infringing in any respect on these patents will be immediately prosecuted for such infringement. Our customers can feel assured of this protection, and of our determination to proceed against any infringers who make, use or sell infringements or imitations of the Kent mills, as we are determined to protect ourselves and our customers."

After meeting our friends in this association and others, we found they had such high regard for the property rights of others, and such high ideals as to justice and business ethics, that it seemed both unnecessary and out of place to utilize in our circulars such warnings against infringement as are commonly so used in other fields.

Assurance.

It seems due to all to state that it is our firm intention to protect ourselves against any and all things which we believe to be a trespass on any rights pertaining to the Kent mill business or the Kent patents or inventions, and that this will be given the same thorough, persistent and careful attention that has characterized the development of this business and the raising of the Kent mill to its present pinnacle of success.

Mr. Chairman and gentlemen, I thank you for bearing with me so long and attentively.

Mr. Fraser was kept busy answering questions at the conclusion of the reading of his paper, all of which he answered very satisfactorily.

This paper was followed by the reading of a paper prepared by the Sturtevant Mill Company. Percy H. Wilson, the secretary, read the paper.

AN IDEAL CEMENT GRINDING UNIT.

By L. H. Sturtevant.

Mr. Chairman and Gentlemen: We wish your valued consideration of, in our opinion, an ideal cement grinding unit, capable of producing cement at an expenditure of about 3.5 H. P. per barrel, and at a wear and tear cost of approximately one-half a cent per barrel, without deviating far from generally successful practices.

As you are aware, there are two methods of grinding clinker, each having some advantages and faults, and each enjoying a measure of approval.

One method is that of ball or roller mills, grinding to 20 mesh as a preliminary to finishing in a tube mill.

The other using the roller or horizontal ball mill for making directly a finished product, by the use of internal screens, or sometimes partially grinding in the mill, and removing the fines by outside separating devices, and returning the tailings, or unfinished product, to the same mill for regrinding.

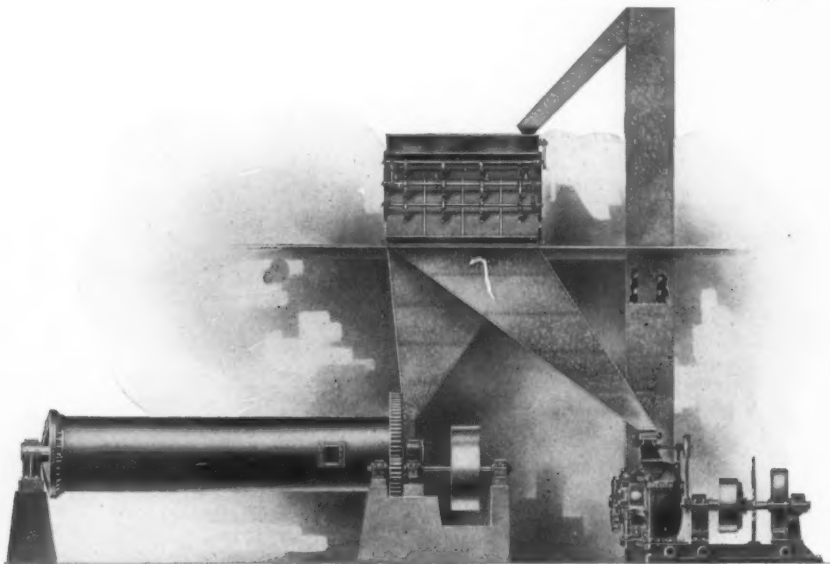
Each plan is expensive from both the power and wear standpoints, and we propose to show how these costs can be very materially reduced by a simpler method, which we ask you to consider.

Referring again to the present form of grinding unit, i. e., the use of a ring roll pulverizer that can produce an enormous amount of material reduced to 20 mesh and finer (from 45 to 50 barrels per hour with a consumption of 30 to 35 H. P.) and the passing of this material to three tube mills of usual size which finish it, and estimating the average power for each tube mill at 75 H. P., it would mean an expenditure of 225 H. P. for this unit (ring roll mill and three tube mills) producing 45 barrels per hour of finished cement at an expenditure of approximately 5.8 H. P. per barrel.

Figuring on the roller or horizontal ball type of mill it is fair to say that it would take four of the largest and best machines built today to produce an equal output (45 to 50 barrels) per hour of finished cement. Estimating these mills to require 65 H. P. each, it would make the power per barrel 5.8 H. P.

Ring roll mills as preliminary grinders for tube mills have been very successful on the plan just outlined, but we have found that they can do much better.

A tube mill is not a good crusher, and if fed with



STURTEVANT CEMENT GRINDING UNIT.

material much coarser than 20 mesh, it would certainly not be an economical finishing machine. With a 20 mesh feed it will produce an average of 15 barrels per hour.

Now, suppose the preliminary grinder prepared clinker to 40, 50 or even 60 mesh. What would the tube mill do under these conditions? By actual test, with a 50 mesh feed, its output doubles. Now this tube mill will take no more power producing 30 barrels per hour with a 50 mesh feed than it will take when grinding 15 barrels with a 20 mesh feed.

A ring roll mill will easily produce 50 mesh material with no more power than 20 mesh, in fact, less power is required, but its output is necessarily reduced.

Working with these facts as a basis, it is only necessary to find the most economical fineness for both preliminary grinder and tube mill, or a point where one ring-roll mill will just equal one tube mill in output, and have these two machines, with a Sturtevant-Newaygo screen between, form a unit.

With usual clinker, the most economical product of the ring-roll mill for this unit appears to be 50 mesh, and doing this work the ring-roll mill has an output of 30 barrels per hour, 80 per cent of which is 100 mesh and finer, with an expenditure of less than 30 H. P.

The tube mill also easily handles all of this fine product, as it is then required to put on only the finishing touches or rub down the unusually fine product of the preliminary grinder to pass cement requirements. It is then truly a finisher and doing its best work with maximum production, as is seen by the satisfactory fineness of its output. (85 per cent 200 mesh.)

Thus, the results of the Sturtevant unit consisting of one ring-roll mill, one Sturtevant Newaygo screen and one tube mill are 30 barrels of finished cement with a total expenditure of 105 H. P., or 3.5 H. P. per barrel to a fineness of 97 per cent through 100 mesh and 85 per cent through 200 mesh.

Mechanically, the ring-roll mill is most simple, and has only four wearing parts—the ring and three rolls. No other cement reducing machine approaches it in durability. This machine has no scrapers, no plows, no fans, no pushers and no internal screens. The feed rock falls directly onto the inner face of the vertically revolving concave anvil ring, and is held thereon by centrifugal force, until the rolls run over and crush it off the ring, after reducing it to powder. The anvil ring is at all times protected from wear by a layer of rock 1" thick, which is crushed down upon itself by the hammer rolls. Thus the clinker is largely forced to crush itself. There is no slip whatever; the rolls simply roll and crush. No material in process of grinding is thrown with cutting force against internal screens, or any small or delicate surfaces. Another unusual feature, and one found in very few machines is accessibility: by removing four bolts the entire front opens like the door of a safe, carrying the three rolls entirely outside of the mill, and leaving the ring exposed to view and within easy reach. One hour's time is ample to replace all three roll tires and the ring, thus making the mill as good as new.

As before stated, there are only four wearing parts of importance, and these often run from six months to a year with no repairs whatsoever. The mill itself is as simple as a tube mill, but operates with much less power and far less wear.

We were never believers in internal screens for pulverizers, because no screens of this type are large enough to remove the fines as fast as made by any good grinder, and if the fines are not removed promptly from the mill they clog and cushion all grinding members, reduce their efficiency and cause the rollers to run hard. Unremoved dust causes heavy drag and useless wear. Material already sufficiently ground should never be left in the mill to be acted upon a second time.

Note the area of any internal mill screen and it will be found to vary from 12 to 20 square feet in different mills. These interior screens are necessarily small and of inferior type. Yet, should even an outside screen of the most effective kind be used, of the same size, or even twice the size, the output of any good mill would smother it with fines. We know screens, and we think you will agree that, although the Sturtevant-Newaygo is the most efficient screen known, yet no single Newaygo screen, with 48 square feet surface area can properly handle the output of even one large ring-roll mill. The great efficiency of the ring-roll mill is obtained by removing all fines from the mill as soon as made. The mill always works on clean material. Neither mill or screen is ever permitted to be crowded or smothered by clinker already sufficiently reduced. Both mill and screen are the best that can be built and each works independently of the other and to the best advantage.

The ring-roll mill does everything that any other ring and roller or ball mill can do, but without the excessive

repairs which these require. Because it has a clear track, no drag, and no delicate parts, the ring-roll mill operates with a minimum of power and least wear. In other words, it presents as simple a proposition as the tube mill, and no inside finished dust to cushion the grinders, and no delicate inside screen to cut and wear.

A one-mill unit seems to have advantages, but to come down to "brass tacks," which of these methods will produce finished cement at least cost?

No one can deny the excessive wear and tear cost of any one mill finisher, or the delays caused by constant replacements, or the inefficiency of interior mill screens.

What is simpler than a tube mill with no delicate parts, no shutdowns, except for lining replacements which are seldom required, no screens, but a smooth, finished product direct from the mill? Our answer is the ring-roll mill, and the ring-roll mill, the tube mill and the Newaygo screen, combined in one unit, cannot be approached for easy running, least wear, and great product of finest cement.

Can anyone deny the simplicity of the ring-roll mill with its four wearing parts which should easily run six months without renewals? Then, where can you find a cement grinding unit so simple—and simplicity counts—so free from annoying shutdowns, or one which insures continuous production.

The first cost is low, operating cost much less, and the output larger than anything yet produced. Does not this appear reasonable and appeal to your common sense?

The figures herein given are believed to be conservative and based on actual tests.

The next paper presented was that of the General Electric Company on the subject of "Steam Turbines." This paper was read by B. F. Bilsland, of the Chicago office, and proved to be highly interesting.

STEAM TURBINES.

By B. F. Bilsland, General Electric Company, Chicago.

There are two distinct types of turbine prime movers, that is, water turbine or water wheel and steam turbine. Each of these from the design or theory standpoint have two distinct types, the impulse and reaction types. In the impulse type the energy in the fluid is transformed to mechanical energy or work by impact, and in the reaction type by expansion or reaction.

Further discussion will be confined to turbines employing steam as the active fluid.

In the Curtis turbine the steam is expanded in nozzles which are so designed to allow it to impart to itself a high velocity; from the nozzle it passes through a row of rotating buckets, thence through a row of stationary or diverting buckets, and again through a row of rotating buckets, which completes one stage of action. This process is repeated until as nearly as possible all the energy in the steam has been transformed to mechanical energy.

In the Parsons turbine no expanding nozzles are employed; the steam is admitted directly to the first row of rotating buckets, thence through stationary or diverting buckets and so on, finding its way through the turbine, expanding as it travels and giving up its energy by impact.

The reasons for the existence of the steam turbine are many:

First. It is a mechanically simple machine. Second. It works in a field which the reciprocating engine cannot occupy; it gives us the possibility of good efficiency of action in a wide range of pressure, which is an important advantage over the steam engine, as mechanical limitations greatly reduce its effective range.

Generally speaking, the efficiency of a machine depends upon the range of temperature through which it can be worked, and this range with steam at the best is quite small, it being limited by pressures which are practicable. The reason why we use steam as a motive fluid is that water is cheap and common. It affords the most available method we have of turning heat into motion.

The Curtis type of steam turbine is a multiple stage process in which a number of elements are used. The element has no pressure behind it, the pressure of the chamber in which it operates surrounds it, and it is simply blown around as the wheel of a wind mill.

The steam turbine is in its infancy when compared to the steam engine, yet wonderful development or evolution

has taken place in a few years, and it is today the most promising and superior steam prime mover in existence from the standpoint of cost, economy and operation. It is pre-eminently adapted to driving high speed devices, since a high speed is essential to steam economy. Therefore, up to the present time the steam turbine is mostly used for driving electrical generators which have been designed to operate at comparatively high speed.

The largest and most economical generating unit ever built is of the Curtis type, operating today in the Commonwealth Edison Company's plant at Fisk street, Chicago. It is rated 14,000 kilowatts, which is approximately 20,000 horsepower. Three of these machines are carrying commercial load. They have not been officially tested, but from calculations we are confident they are more economical than the 8,000 kilowatt machines in the same station, which are the most efficient turbines ever tested. Tests of the latter turbines operated on commercial load showed a steam consumption of 12.8 pounds per kilowatt hour (which is equivalent to about 8½ pounds per 1 horsepower hour) the power being measured at the switchboard.

This does not apply only to large turbines but almost equally as well to small turbines. Turbines are being manufactured covering the widest range, in regard to capacity, of any type machine, ranging in capacities at present from 7 kilowatts to 20,000 kilowatts.

The Curtis type impulse turbine is built with both horizontal and vertical shafts. There is only one advantage the horizontal machine has over the vertical (eliminating head room), which is that it can be operated with the rotor to a greater degree unbalanced. The vertical machine has many advantages over the horizontal:

The relative positions of revolving and stationary parts are definitely fixed by the step-bearing.

The stationary part is symmetrical and free from distortion by heat.

The shaft bearings are relieved from all strain and friction is practically eliminated.

The shaft is free from deflection and can be made of any size without reference to bearings.

The turbine structure affords support and foundation for the generator.

The cost of foundations is small and their support is naturally simple.

Much floor space is saved.

All parts of the machine are accessible.

It is applicable for a base type condenser which allows the steam to move entirely in the direction of a straight line which gives least back pressure and, of course, best possible vacuum; facilitates operation as operator can see and operate all parts, and move only approximately within a circle of a radius of four feet.

Both the horizontal and vertical shaft type turbines have many advantages over the reciprocating engine. In general they are:

Complete unit including generator, less expensive; very much less floor space required; very much less expensive foundations; less attendance necessary, that is, less operating expense, condensing types very much higher efficiency, non-condensing types efficiency approximately the same. Life of efficiency much longer—repair and maintenance much less. Starting much easier and quicker. No damage results by water being carried into the machine from the boilers, and it is more adapted for driving, by direct connection, electrical generators.

The Curtis steam turbine of today has advantages which make it superior to any other steam prime mover, and in combination with the General Electric Company's generators, it is an ideal source of power. The most important of these advantages are briefly:

1. High steam economy at all loads.

2. Economy in floor space and building materials required.

3. Moderate initial cost and low maintenance expense.

4. Simplicity of construction; absence of all small clearances; absence of thrust balancing pistons with their heavy and uncertain leakages.

5. Maintenance of efficiency and general durability.

6. Ability to effectively utilize the large increase of pressure and high vacuum.

7. Ability to use high superheat without mechanical difficulties.

Probably the most interesting and most talked of prime mover today is the low pressure steam turbine, the number of installations of which is comparatively small.

The low pressure steam turbine is so called because it is designed to operate from steam at and below atmospheric pressure and not above. It is that part of our condensing turbines which makes use of the low pressure steam and differs only from our standard turbines in the omission of the high pressure stages. All points of design and operation apply to both.

The low pressure turbine is best adapted for use in non-condensing steam engine plants where the steam at atmospheric pressure is going to waste, but is also applicable in condensing reciprocating engine plants, on account of the high efficiency of the condensing turbine in comparison to condensing steam engines.

In order to get an idea of the possibilities of a low pressure turbine I will tell you the available energy there is in steam under some different conditions of pressure. Say we take steam at 165 pounds absolute pressure and expand it to one-half pound absolute pressure (29" vacuum), we have available 271,000 foot pounds of energy per pound of steam. Now, if we expand steam from the above pressure (165 pounds absolute) to 14.7 pounds absolute, or atmospheric pressure, we have available 135,000 foot pounds of energy per pound of steam, which shows that half the energy expanding to a 29" vacuum is in the steam below atmospheric pressure. It is, therefore, evident that the low pressure stages of a turbine give to us one-half of the developed energy, if not more, for in many types of turbines the low pressure stages give a higher theoretical efficiency than the high pressure stages.

It is also interesting to know that of all the energy in steam from atmospheric to 28" vacuum, 29 per cent of the energy is between 26" and 28" of the vacuum.

From this you can see the gain, or advantage, when using a turbine of having high vacuum, for the energy is in the steam you have; then why not get it out? This presupposes a type of turbine that can be successfully designed to utilize the benefits of extremely low pressure. Steam at 28½" vacuum has a volume 200 times that at 17½ pounds gauge, and for this reason steam engines, on account of mechanical reasons, cannot be designed and operated at such extremely low pressure. This is also true to a certain extent with some types of steam turbines.

The average vacuum for condensing reciprocating engines is 24" to 25" and when steam is expanded from 165 pounds absolute to 24" vacuum we have used only 76 per cent of its available energy; 24 per cent is there-

fore thrown away; also the capacity of a reciprocating engine operating condensing is only approximately 25 per cent more than when operating non-condensing, and the same amount of steam used in condensing operation will give 75 per cent of the capacity operating non-condensing, and if the steam is used through an economical low pressure turbine, it will not increase the capacity 25 per cent, but will double it (increase it 100 per cent). The use of a low pressure turbine in a condensing engine plant without consuming more water or coal will practically increase the plant capacity from 40 to 50 per cent and reduce the cost of power approximately 33 1/2 per cent per kilowatt hour. By consuming approximately 25 per cent more water and coal a low pressure turbine could be employed which would increase the plant capacity 80 to 100 per cent and reduce the cost of power approximately 37 1/2 per cent per kilowatt hour; furthermore, the use of a low pressure turbine in a non-condensing engine plant without consuming any more water and coal, will increase the plant capacity 80 to 100 per cent and reduce the cost of power approximately 50 per cent per kilowatt hour. It is in such installations that the low pressure turbine is most applicable and desirable. The most economical and most desirable way to operate a low pressure turbine is to operate the generator in parallel with the high pressure steam driven generators, and allow the turbine to float on the system and deliver all the energy it is capable of at all times from the exhaust or low pressure steam fed to it, be governed or high pressure machines to take care of the fluctuations in the load.

At the conclusion of the paper Mr. Bilsland was asked quite a number of questions relative to the different types of turbines and from the interest manifested it would seem as if the manufacturers of cement were ready to go into the matter more deeply.

H. B. Eldridge next presented a paper on New Giant Griffin mill. Mr. Eldridge prefaced his remarks by saying he was no orator and immediately launched into the paper with the zest of an expert. He is one of the old time machinery men who understand grinding and was able to answer all questions at the conclusion of his paper.

THE GIANT GRIFFIN.

By H. B. Eldridge, The Bradley Pulverizer Company, Boston, Mass.

I wish particularly to call to your attention the improved construction of the Giant Griffin which we have recently put on the market. So that you will more fully appreciate the great difference between the 30" Griffin and the Giant Griffin I will show you a few photographic slides of both mills. We will first have the 30" mill as we built it from 1892 to 1903-4. You will note that the entire frame is of cast iron. Many hundreds of this type of mill were sold to cement manufacturers and many of you gentlemen have that type of mill in successful operation and, as you all know, it is a fact that a very large percentage of the successful cement companies throughout the world are users of the Griffin mill. Along in 1903-4 we built a 30" mill with a composite frame as shown in the slide now before you. This construction was considered an improvement in some respects. Aside from changes in frame construction and minor changes in pulley, body, etc., the 30" Griffin mill is now built in practically the same way that it was in 1892.

There are many small parts in the pulley body and it requires more or less intelligent attention and there are plants where they do not get this, and as a consequence have been rather unjustly criticised by some people.

You all know, however, that a very large percentage of the Portland cement made in the United States is pulverized by 30" Griffin mills. I have elaborated on the merits and demerits of the 30" mill because I think you will more fully comprehend the vast improvement in the simplified and heavy construction of the Giant. The dieing in this mill is 40" inside diameter, as against a 30" dieing in the 30" mill. The roll head weighs 850 pounds, as against a 350 pound roll head in the 30" mill. The face of dieing and roll head being 7", as against 6" in the 30" mill. The roll shaft being 5 1/2" in diameter as against 4 1/2" in the 30" mill. You will note the simplified construction in the pulley. There are but three or four parts, as against perhaps fifteen parts in the 30" pulley body. The trunnions in the Giant are 4 1/2" in diameter and 5" long. The gibs are in one piece instead of being half gibs as in the 30" mill, and the ball trunnions and gibs work in an oil-tight pocket. You will note the ball-race at the top which carries the weight of all moving parts. All bearings are self-oiling and are fully removed from all grit and dust. The pulley as shown is 42" in diameter and 16" face. The Giant weighs about 27,000 pounds, as against about 12,000 pounds for the 30" mill. This mill has got the weight in it and if you will follow me closely I will compare the two mills as to power, capacity, etc.

The Giant is driven 160 to 165 revolutions per minute. The 30" from 185 to 215. The maximum power required to operate the Giant at full capacity is 60 horsepower, as against 35 horsepower for the 30" mill. The capacity of the Giant on cement clinker is from 12 1/2 to 17 barrels per hour, as against an average of from 4 to 6 barrels for the 30". There is about the same ratio of difference in the work of the two mills on limestone and shale. The cost of upkeep on the Giant grinding clinker will be less than 1 cent per barrel, as against 2 cents for the 30". We believe that it will be much less than 1 cent with the Giant and base our opinion on facts as developed at the plant of the Lehigh Portland Cement Company at Allentown. We have had a Giant there for some months grinding clinker and the upkeep of that mill is not one-third of a cent per barrel. We therefore feel perfectly safe when we talk 1 cent per barrel. Are not these wonderful results, gentlemen?

We feel that the Giant Griffin will reduce the grinding cost on cement materials from 25 to 35 per cent.

The Bradley Pulverizer Company has never wandered from the "suspended roll" type of mill. We have built one roll and three roll mills and have satisfied ourselves that the single roll mill is by far the best for the grinding of cement materials. There is one very important feature that I wish particularly to call your attention to.

Many people suppose that there are less fines in the product of the Griffin than in that of the tube mill. The contrary is the fact, however, and it is something that anyone can prove for themselves. We have made numerous tests of both the Giant and 30" mill product as compared with standard tube mill product in the same plant and consequently on the same clinker and find that the Griffin product always shows from 1 to 2 1/2 per cent more 200 mesh stuff than the tube product, when the percentage of 100 mesh is the same in both.

The same advantage is with the Griffin when the product is put to the suspension test for floats. These are simple tests, making it easy to prove or disprove the statements. It is also remarkable that no matter how fine the Griffin product is, each particle is angular and sharp and should make better and stronger cement than the little round or flat particles such as the tube mill produces. A magnifying glass will substantiate this statement.

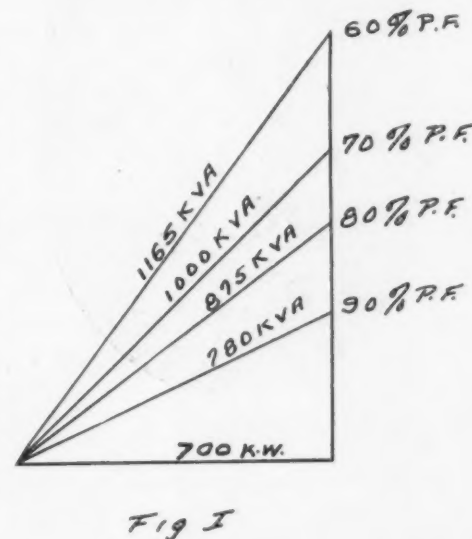
I think that you will agree that if our claims for the Giant Griffin mill are based on fact that we grind a barrel of cement with much less horsepower than it can be ground by any method now in use and that the cost of upkeep is very much less than by any other method, and that a plant equipped with Giant Griffins can be much more compact, making a saving on buildings and power plant and doing away entirely with auxiliary machinery, screens, etc., this mill being entirely self-contained and delivering the cement into a conveyor which takes it to the storehouse, and as the mill does the best work when fed with material, either clinker or limestone or shale, which has passed over a 1 1/2" screen, it will be seen that the clinker needs nothing but a common pot crusher between the kiln and the Giant Griffin.

E. A. Hulst, of the General Electric Company, presented a paper on "Electrical Equipment of Cement Mills," which, owing to the shortness of time, was not read, and is here presented for the first time.

ELECTRICAL EQUIPMENT OF CEMENT MILLS.

By E. A. Hulst, General Electric Company, Chicago.

In no other industry is the selection of electrical equipment more important than in the manufacture of steel and cement. Ranking next to the steel industry is the manufacture of cement. Since the raw materials are so abundant and accessible the most successful cement manufacturer is the one who can manufacture his cement the most efficiently and perfectly with the least cost. This means equipment that will cause the least maintenance cost, stand the severest strains and operate



the most efficiently. Bearing these points in mind and the fact that great gains are made in small savings as well as in large, we will divide our subject up in five parts, namely—kind of current to be used, generation, transmission, motive power, power factor.

Under the heading, kind of current, we will discuss the merits of the two, direct and alternating.

Direct current equipment costs from 1 to 2 per cent more than alternating. The efficiency of alternating current equipment is from 1 to 2 per cent more than that of direct. The starting torque of alternating current motors is equal to or greater than for direct current motors. The cost of installation aside from wiring is about the same for both equipments.

Alternating current apparatus has the very great advantage of absence of commutators and all their attendant expensive troubles such as short-circuiting between bars, grounding to motor frames, wear of commutator surface, brush wear and brush holder adjustment.

The list of costly troubles to which the direct current motor particularly and the direct current generator to a lesser degree is inherently heir could be extended indefinitely.

One serious disadvantage and danger to direct current equipment is the liability of shunt fields being broken and the motor running away. On alternating current equipment this is entirely eliminated as the alternating current motor has a definite limiting speed only about 5 per cent above its full load speed.

Another disadvantage of direct current equipment is the use of open and exposed starting devices, which are continually being burned, due to cement dust getting on the contacts. It is practically impossible to totally enclose such devices.

The amount of floor space taken up by alternating current equipment is less than that of direct current. The air gap, or space between armature frame, in direct

current equipment is very little larger than that of alternating current equipment, although this is not generally known. The reason the air gap looks much larger on direct current equipment is due to the fact that the direct current motor has a few salient poles covering only a portion of the armature circumference, whereas on alternating current the total circumference of the rotating member is covered, making the air gap look somewhat smaller than it really is. Good substantial dustproof bearings make this feature equal in both cases.

Any induction motor if overloaded beyond a certain point, say at two or three times full load torque, "breaks down," that is, stops, thus notifying attendants of trouble. Under similar circumstances a direct current motor would be destroyed by the excess current. Direct current systems in a cement plant are practically limited to 250 volts, at which voltage the cost of wiring and transmission for direct current and alternating current systems is about equal, but for alternating current systems 440 and 550 volts are perfectly standard and commonly used. The cost of copper conductor for a 440 volt alternating current system is just one-fourth of the cost of copper for a 220 volt direct current system, while at 550 volts the cost of copper is still further decreased to less than one-sixth the cost of the equivalent 220 volt direct current system.

At the present time alternating current equipment is developed to give as much speed variation as direct current. From the above you can readily see that alternating current equipment largely overbalances direct current.

Summing up, the alternating current system has the following advantages:

- First. Lower first cost.
- Second. Lower maintenance cost.
- Third. Higher efficiency.
- Fourth. Positive breakdown point.
- Fifth. Requires less skilled attendance.

The only disadvantage claimed for the alternating current system is in the matter of power factor, which will be treated later.

The ideal cement mill motor is one of alternating current with rugged mechanical construction, the active material arranged to give the maximum radiation of heat, bearings of liberal design, self-oiling and dustproof. The motor should be wound in such a way that it is easy to repair, having open slots so that form wound coils can be used. All coils should be thoroughly protected so that falling bodies will not injure them, but arranged in such a way that they can be readily blown out by air. It is not a practical proposition to install semi or totally enclosed motors, as the dust is bound to get into the motor, and if allowed to accumulate to any great extent, will cause trouble. Motors will operate very satisfactorily if blown out occasionally by compressed air. The cement dust is very gritty and the insulation of the coils should be of the most rugged construction.

The selection of the proper frequency voltage for alternating current is a very important one for cement mill work, it being borne in mind that the majority of machinery has very heavy starting torque. We will only discuss the two important frequencies that are most used, 25 and 60 cycles.

The cost of 25 cycle equipment is about 2 to 3 per cent higher than for 60 cycle. The efficiency of 25 cycle equipment is about 1 to 2 per cent greater than 60 cycle. The power factor of 25 cycle equipment is from 4 to 6 per cent higher than 60 cycle equipment. The distribution losses for 25 cycle equipment are about 5 per cent less than 60 cycle.

The starting and breakdown torque of 25 cycle motors is much higher than for 60 cycle motors, but the greatest advantage of 25 cycle equipment lies in the possibility of building motors for slow speeds. Standard speeds for 25 cycle motors are slower than for 60 cycles and speeds down to 150 revolutions per minute are entirely feasible, while a 60 cycle motor to operate at 150 revolutions would have 48 poles, an almost impossible construction for a motor under 300 horsepower.

One can readily see that the advantages gained by the 25 cycle equipment more than offset the slight increase in cost over the 60 cycle system.

The subject of generating equipment is of such a broad nature and conditions vary so for different plants we will not take it up in detail, but will gladly take up any special points anyone wishes discussed.

The subject of transmission is one that should be given very careful study.

For the distribution of power from a switchboard located at the plant:

The switchboard should have 50 per cent greater capacity than the average demand, and it is well to have all line switches in duplicate, so that the switches can be cleaned while the plant is operating. Each mill should be controlled by its own panel so that if trouble occurs in one mill the rest of the plant is not interfered with in any way.

The transmission of alternating current at high voltages, 22,000 and up, can be taken care of in a very satisfactory manner, the line losses not exceeding 10 per cent with very moderate copper investment. Aluminum cell lightning arresters can be installed, which will protect the line from lightning discharges and power surges.

The distribution of low voltage current deserves careful study for large savings can be made. The inductive and resistance losses may be very great if the lines are not properly laid out. The arrangement of the conductors should be studied out very carefully and installed in such a way that losses will be minimized. It may be surprising to know that by the mere arrangement of conductors it will sometimes be possible to make a saving of 15 per cent in transmission losses.

Feeder cables should be designed to take care of the heavy starting currents without excessive heating. It is not practical to transmit over 2,000 kilowatts at 440 volts more than a distance of 1,000 feet, as the excessive line losses would be more than compensated by the installation of transformers.

The subject of motive power is of very great importance at the present date.

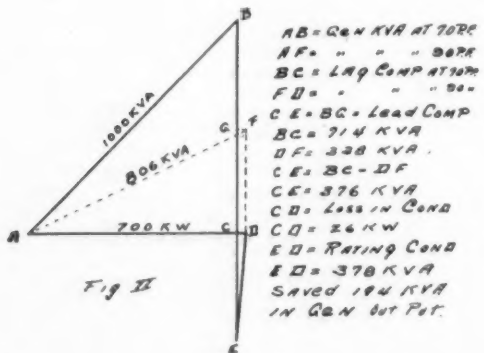
This subject has been discussed at length by a previous speaker. In general where condensing water is plentiful the steam turbine is the ideal prime mover. Gas engine plants have been installed in some places, but in the present state of the art the high maintenance charges and the greater initial investment make the economy of such a plant very doubtful. In some cases where the cheapest gas is available it has been shown that the power can be produced more cheaply by boiler and steam turbines than in gas engines. In one large plant, where four large gas engines are used, together with a steam auxiliary plant, the gas engines operating under the most favorable conditions are only able to operate 70 per cent of the time

throughout an entire year. In other words, out of four engines, less than three can be kept in operation on account of necessary repairs.

The subject of power factor is one of very great importance. Considerable expense and trouble could be saved if this subject were given more careful study. It would be well to explain by diagram just what power factor really is.

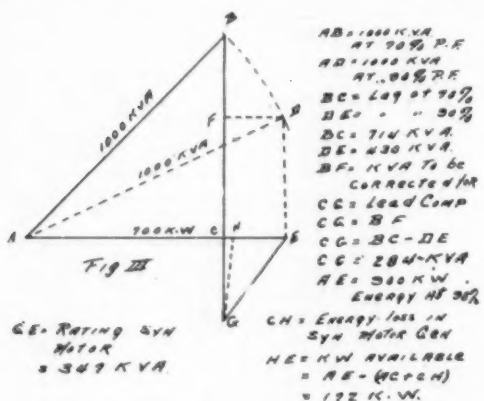
Figure 1 shows the relative relation between the generator K. V. A. output and the energy in kilowatts consumed by motors at different power factors. The energy load at 700 kilowatts being constant at 60 per cent power factor it will be necessary to develop 1,165 K. V. A. Raising the power factor to 70 per cent this would be reduced to 1,000 K. V. A. Further raising the power factor to 80 per cent would further decrease the generator K. V. A. to 875. Raising the power factor still further to 90 per cent would still further decrease the K. V. A. to 780. This shows a saving of 385 K. V. A. in generator output with an energy load of 700 kilowatts, raising our power factor from 60 to 90 per cent.

There are two different ways of increasing the power factor, and since the power factor of induction motors decreases rapidly with the decrease in load, as is readily seen by having all motors run at full load and slightly overloaded, will raise the power factor to a considerable extent. The maximum power factor obtainable in this



way would be about 80 to 85 per cent. Many times it is necessary to increase the power factor to 90 and 95 per cent, due to the vast savings which can be made under certain conditions. This is accomplished by the application of a synchronous motor or a synchronous condenser, which supplies a leading current to the line, counteracting the lagging current produced by induction motors and distribution losses.

Figure 2. Take for example, this system is operating at 70 per cent power factor, with an energy load of 700 kilowatts, generator K. V. A. or output is 1,000. The conditions are—generator is running overloaded, there being no need for more power. It is desired to reduce the output of the generator and obtain the same energy load. Raising the power factor to 90 per cent and adding CD to our energy line the energy consumed by the synchronous condenser we will have the line AF, the generator K. V. A. output at 90 per cent power factor. The line BC represents the lagging or wattless component of the system at 70 per cent power factor; the line FD represents the lagging or wattless component of the system at 90 per cent power factor. Thus, you can readily see it is necessary to introduce into the system a leading current equal to the line BG, which represents the amount of lagging current which must be corrected to raise the power factor to 90 per cent. Drawing the line CE equal to BG, which represents the leading current supplied by



the synchronous condenser and allowing 7 per cent of this figure, or the line CD for the losses in the condenser, we will have the triangle ECD, a synchronous condenser triangle. The line ED represents the rating of the synchronous condenser. By the application of a synchronous condenser of 378 K. V. A. the energy consumed would be increased to 726 kilowatts and the generator output decreased to 806 K. V. A., a saving of 194 K. V. A. in generator output, which is enough to reduce the overload on our generator.

Taking another example, as shown in Fig. 3, where our energy consumed is 700 kilowatts, the generator output 1,000 K. V. A., power factor of our system 70 per cent. The generators are running at full load, but it is desired to get more power for driving machinery, but we cannot afford to overload our generators.

The line AC represents the energy component, the line AB is the generator K. V. A. output and the line BC is the lagging or wattless component of our generator output

at 70 per cent power factor. By increasing our power factor to 90 per cent, the line AB would take the position AD. This would give us available a total energy as shown by the line AE at 90 per cent power factor. In order to correct from 70 to 90 per cent power factor we will have to insert in the system a leading component equal to the difference of the lagging component at 70 per cent power factor and the lagging component at 90 per cent power factor, represented by the lines BC and DE respectively. The line BF represents this difference in lagging currents which is to be corrected for. The line CG is equal to line BF and represents the leading component of our synchronous set. The triangle GCE represents the triangle of our synchronous set. Allowing 10 per cent for the losses of our synchronous set we will have available the line HE, or 172 kilowatts, the energy gain in raising the power factor from 70 to 90 per cent. This can be applied by having our synchronous motor drive an alternator or direct current generator. The rating of the synchronous motor is shown by the line CE, or 347 K. V. A. Thus, by the installation of a 347 K. V. A. synchronous motor generator set, we will increase our power factor to 90 per cent and increase the capacity of our system 172 kilowatts.

Following the reading of the papers, a delightful luncheon was served in the rooms adjoining and the afternoon was given up to automobile trips about the city as guests of the local cement manufacturers.

At night the usual dinner was served at 7 p. m., in the red room on the nineteenth floor of the La Salle Hotel.

E. M. Hagar, former president of the association, presided. George S. Bartlett was the toastmaster. Among those who responded to toasts were A. H. Craney, Jr., George E. Nicholson, Bethune Duffield, N. D. Fraser, Spencer B. Newberry, Prof. Schott, the celebrated German cement expert who was sent by the German government to inspect the cement plants in this country; W. E. Cobean, J. U. C. McDaniel, J. F. Lockley, Benjamin F. Affleck, and F. R. Bissell.



EDWARD M. HAGAR, CHICAGO, ILL., PRESIDENT UNIVERSAL PORTLAND CEMENT COMPANY.

Mr. Affleck was the choir master and led the singing.

The banquet was marked by much good fellowship and the speeches were all in a happy vein. George Bartlett proved to be an ideal toastmaster and kept his auditors in a constant good humor.

Thursday the association met at the La Salle Street station at 10:20 a. m., where they boarded the Lake Shore & Michigan Central train for Buffington. The trip through the immense plant of the Universal Portland Cement Company at this place was one of the most interesting features of the association's meeting. Many exclamations of surprise and wonder were heard at the immensity of the plant and its perfect equipment. The plant was running at its full capacity, and the visitors had an opportunity to see this great institution at its best. The foundations for the new addition were shown to the visitors.

E. M. Hagar, president of the Universal Portland Cement Company, explained that the new addition would come into bearing about the first of the year and that the next plant to be built by the company would in all probability be at Duluth. The Birmingham plant, Mr. Hagar said, was not to be built until after the plant at Duluth got started, according to the present plans.

After the guests finished their inspection tour they again boarded the two Pullmans and started on the way to Gary. En route a delightful luncheon was served. After the dusty, hot trip through the mills full justice was done to the spread.

Arriving at Gary, the visitors were first taken on

a short tour through the city, the youngest city of its size probably in all the world. The story of Alladin and his wonderful lamp is immediately brought to mind when one takes into consideration that four years have scarcely elapsed since the site of this thriving city was only a barren, sandy waste with but few houses to mark the spot. Today a thriving metropolis occupies this strategic location selected by the steel trust after careful deliberation. That its judgment was good is amply verified by the success which has attended its operation. The Illinois Steel Company owns the entire lake front property from Gary to Indiana Harbor and for miles back, which is two-thirds of Indiana's water front. These two cities are miles apart and are rapidly being built up between. The party boarded observation cars, where an inspection of the ore docks was made unloading ore for the blast furnaces, power plant, open hearth furnaces, roll mills, etc.

Mr. Hagar explained the various details of the operation to his guests. These plants occupy several miles along the lake front. The additions which will be made will practically double the output of these steel mills within a few years. The future of Gary seems to be secure. Other manufacturing establishments are already negotiating for sites to erect manufacturing plants. Probably the most interesting features of the plant are the handling of the ore, the utilization of the gases for power and the almost automatic method of making the steel rails. There were but a few men noted in the giant building in which the steel rails are manufactured. Here the red hot billets of steel are shoved between immense rollers with terrific speed, backwards and forwards, without being attended by a single human hand, and finally coming out a finished product. They are immediately loaded on cars by steel cranes lifting with magnets.

The special train whisked the party back to Chicago, where it disbanded. Many left the train at Englewood to catch the eastern trains for home.

NOTES OF THE MEETING.

Among the machinery manufacturers in attendance at the meeting the following were noted: Geo. H. Fraser, Horace G. Kimball, of the Kent Mill Company, New York City; M. J. Williams, Williams Patent Crusher & Pulverizer Co., Chicago; H. B. Eldridge, Bradley Pulverizer Company, Boston; E. A. Hulst and B. F. Bilsland, of the General Electric Company, Chicago; Thomas Fuller, H. G. Barnhurst, Thomas Murray, of the Lehigh Car Wheel & Axle Works, Catawqua, Pa.; H. A. Johann, Taylor Iron & Steel Company, High Bridge, N. J.; and D. C. Morrow, United Iron Works, Iola, Kan.

Tuesday night the Chicago sales managers entertained the cement manufacturers with a sumptuous dinner at Bismarck Garden. There were thirty-five in the party and the occasion was one of the most enjoyable of the entire meeting. B. F. Affleck led the fun, which was "fast and furious." Bismarck Garden is at its prettiest at the present time and its fame is national. The dinner was served al fresco while the beautiful strains of Ellery's band floated through the air. The occasion was one long to be remembered.

W. S. Mallory received a telegram from New York Wednesday informing him of the death of his wife's father. He left hurriedly and was unable to make the trip to Buffington and Gary.

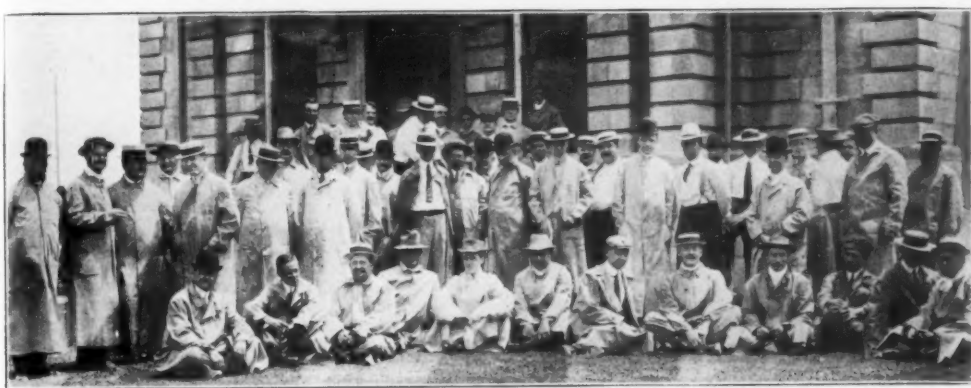
"Has Anybody Here Seen Kelley?" was one of the popular songs of the meeting. R. W. Kelley, who represented the Virginia Portland Cement Company, made his initial appearance at this meeting. He was welcomed enthusiastically, partly because his name was Kelley and partly because he proved to be a genial good fellow.

B. S. Smith, one of the Universal boys, was in charge of the trip to Buffington and Gary and he worked out the details to perfection. Mr. Smith could easily get a job with the "Cook Tours," as he has had sufficient experience in handling large gatherings to fit him for such a position.

E. M. Hagar, the president of the Universal Portland Cement Company, was assisted by the following members of his force in entertaining the delegates at Buffington and Gary: B. F. Affleck, Morris Metcalf, J. G. Bergquist, John Ahnfeld, C. W. Boynton, J. H. Liberton, J. H. Chubb, B. H. Rader, J. C. Van Doorn and B. S. Smith.

Next year the Chicago A. A., the Marquette and the German-American Portland Cement Company will take the cement manufacturers on a tour of inspection to their mills.

The office of the Association of American Portland Cement Manufacturers is in the Land Title Building, Philadelphia, where Percy H. Wilson, the efficient secretary, is always ready to give advice and information relative to the industry. Mr. Wil-



ASSOCIATION OF AMERICAN PORTLAND CEMENT MANUFACTURERS READY FOR A TRIP THROUGH UNIVERSAL PORTLAND CEMENT COMPANY'S PLANT AT BUFFINGTON, IND.

son conducts a very extensive bureau and there are few questions which he cannot satisfactorily answer. He has quite a number of bulletins which will be mailed free to any one asking for them. These bulletins cover a very wide range of subjects and are among the best literature extant on the subject of cement and its uses.

George Bartlett, the human dynamo, was very much in evidence at the meeting. There is probably no one who would be missed more than Mr. Bartlett if he did not show up. He is usually the first on the field and the last to leave. He was unable to make the trip to Buffington and Gary, much to the regret of the balance of the crowd, as he is always the life of the party.

W. E. Cobean, of the Wolverine Portland Cement Company, says that he is especially fortunate because he has not tied himself up on any future contracts of any magnitude and is now able to take care of the business at good prices. His mill has been running full tilt some time past, but the demand has been equal to the supply right along and he has been kept so busy that his long deferred vacation will have to be deferred a little longer.

Amos Kendall, better known as Jerry, was in the thick of the fray and got his full share of enjoyment out of the meeting. Jerry has a few new stories that are "pippins." Horace Kimball is willing to subscribe to a fund to have Jerry compile an almanac of his jokes and Jerry is seriously considering the matter. Now if enough advance subscriptions for the almanac are received, Mr. Kendall will go ahead with the work.

The photograph taken of the members on the lawn in front of the office of the Universal Portland Cement Company shows them in the costumes which they put on to go through the mill.

H. B. Eldridge, the genial representative of the Bradley Pulverizer Company, had a great deal of difficulty getting a costume large enough to hold him. He lost several pounds going through the mill.

A. Beck, president of the Oklahoma Portland Cement Company, Ada, Okla., says there is lots of concrete work going on in Oklahoma. Needless to say, "O K" brand is largely used. Even the additional capacity is taken care of.

L. T. Sunderland, vice president of the Ash Grove Lime and Portland Cement Company, Kansas City, Mo., was one of the interested visitors. Mr. Sunderland says the big Ash Grove mill has been very busy all year.

Ben E. Allison is a close second to B. F. Affleck as a singer and he lustily joined in, on all occasions.

L. L. Griffiths said that it was hotter in Chicago than it is in Texas. That's why he had to dress in those cool appearing clothes.

D. C. Morrow, of the United Iron Works, Iola, Kan., made his first appearance at this meeting. Mr. Morrow said that his company has secured the patent rights to manufacture the Emerick separator west of the Mississippi river.

Jerry Kendall has discovered that Portland cement can be used for manicuring and several barrels were sold to the hotel shop.

THE ATTENDANCE.

American Cement Company of New Jersey, Philadelphia, Pa.—R. W. Lesley.
Allentown Portland Cement Company, Allentown, Pa.—Thomas Fuller.
Ash Grove Lime and Portland Cement Company, Kansas City, Mo.—L. T. Sunderland.
Continental Portland Cement Company, St. Louis, Mo.—Dwight Harrison.
Castalia Portland Cement Company, Castalia, O.—G. W. Hackett.
Chicago Portland Cement Company, Chicago, Ill.—N. D. Fraser, J. U. C. MacDaniel, D. D. Drummond.
Coplay Portland Cement Company, Philadelphia, Pa.—W. H. Harding.

Dexter Portland Cement Company, Nazareth, Pa.—Joseph Brobst, R. W. Hillis.
Diamond Portland Cement Company, Cleveland, O.—L. A. Reed.
Dewey Portland Cement Company, Kansas City, Mo.—F. E. Tyler, F. L. Williamson.
Edison Portland Cement Company, Stewardville, N. J.—W. S. Mallory.
Elk Cement and Lime Company, Elk Rapids, Mich.—C. A. Whyland.
German-American Portland Cement Company, La Salle, Ill.—Fritz Worm.
Iola Portland Cement Company, Iola, Kan.—G. E. Nicholson, H. C. Koch.
Lawrence Portland Cement Company of Pennsylvania, Siegfried, Pa.—J. F. Miller.
Louisville Cement Company, Louisville, Ky.—T. A. Courtenay.
Monarch Portland Cement Company, Humboldt, Kan.—O. M. Connet.
Marquette Cement Manufacturing Company, La Salle, Ill.—George S. Bartlett, N. W. Duncan, E. J. Dalton, Gold Williams.
Nazareth Cement Company, Nazareth, Pa.—F. A. Daboll.
Newaygo Portland Cement Company, Grand Rapids, Mich.—J. F. Lockley.
Northwestern States Portland Cement Company, Mason City, Ia.—J. W. Shove.
Omega Portland Cement Company, Jonesville, Mich.—Amos Kendall.
Oklahoma Portland Cement Company, Ada, Okla.—A. L. Beck, M. Beck.
Peninsular Portland Cement Company, Jackson, Mich.—J. W. Shove.
Phoenix Cement Company, Nazareth, Pa.—W. G. Hartman.
Southwestern States Portland Cement Company, Dallas, Texas.—J. W. Shove, Jackson, Mich.
Sandusky Portland Cement Company, Sandusky, O.—A. St. J. Newberry, F. C. Pruett.
Superior Portland Cement Company, Cincinnati, O.—Justus Collins, C. F. Harwood.
Standard Portland Cement Company, Charleston, S. C.—W. H. Ford.
Texas Portland Cement Company, Cement, Texas.—F. R. Bissell, L. L. Griffiths.
United Kansas Portland Cement Company, Iola, Kan.—B. E. Allison, Leigh Hunt.
Union Sand and Material Company, St. Louis, Mo.—A. H. Crane, Jr., H. Struckman.
Universal Portland Cement Company, Chicago, Ill.—E. M. Hagar, Morris Metcalf, B. F. Affleck, B. H. Rader, J. C. Van Doorn.
Virginia Portland Cement Company, New York City—R. W. Kelley.
Vulcanite Portland Cement Company, Philadelphia, Pa.—Albert H. Moyer, W. R. Dunn.
Wabash Portland Cement Company, Detroit, Mich.—Bethune Duffield.
Western Portland Cement Company, Milwaukee, Wis.—George S. Bartlett.
Western States Portland Cement Company, Independence, Kan.—J. W. Shove.
Wolverine Portland Cement Company, Coldwater, Mich.—L. M. Wing, W. E. Cobean.

SECURE LARGE CONTRACT.

The Security Cement and Lime Company, of Baltimore, Md., has closed a contract with the Carter Construction Company, of Pittsburg, for 50,000 barrels of Security Portland cement, for the new construction work of the Western Maryland Railway Company's extension from Cumberland, Md., to Pittsburg, Pa. The plant recently enlarged its capacity.

MILLEN PLANT SOLD.

Ann Arbor, Mich., June 19.—Circuit Court Commissioner Benscoe recently sold the Millen Portland Cement Company's plant, of Chelsea, at forced sale to Addison B. Robinson, of Jackson. The purchase price was \$27,000. The cement company got into financial troubles about a year ago and the sale was necessitated by the foreclosure of a second mortgage by the Union Trust Company, of Detroit.

COMPANY DISSOLVED.

Catskill, N. Y., June 4.—The Hudson Portland Cement Company, of Hudson, has certified to the secretary of state that the company has been dissolved. The certificate is signed by Frederick B. Scott, vice president, and R. Lyman Smith, secretary.

WANT CEMENT IN PAPER.

Akron, O., June 18.—Following the example of Cleveland and other larger cities, J. W. Gauthier, director of public service, has recently adopted the plan of compelling the manufacturers to furnish cement in paper bags instead of canvas sacks, as hitherto. Large quantities of cement are used in the construction of bridges, sewers and sidewalks, and the saving to the city and the contractor is considerable because of the cement in the canvas sack taking in the moisture and consequently sticking to the side of the sack, or when dry sifting into the cloth, causing much of it to be wasted. In the paper sacks all of it is saved.

LUMBERMEN'S PORTLAND CEMENT CO.

The Lumbermen's Portland Cement Company held a stockholders' meeting in Kansas City on June 7, and on June 8 the stockholders were taken to the plant at Carlyle, Kan., the party occupying two special Pullman cars. They were much pleased with what they found there.

The following board of directors were elected for the ensuing year: W. E. Woods, Kansas City; H. A. Volek, Kansas City; John M. Byrne, Kansas City; J. W. Ferguson, Kansas City; S. H. Chatten, Kansas City; M. B. Nelson, Kansas City; J. E. Waddill, Denver, Colo.; B. W. Ballou, Neodesha, Kan.; Thomas H. Bowls, Iola, Kan.; Charles H. Apt, Iola, Kan.

This board of directors met on June 10 and elected the following officers: W. E. Woods, president and general manager; John M. Byrne, vice president and treasurer; H. A. Volek, secretary. Executive committee: W. E. Woods, H. A. Volek, J. M. Byrne, S. H. Chapman and Thomas H. Bowls.

INLAND COMPANY BUYS CRUSHERS.

Allentown, Pa., June 21.—The Inland Portland Cement Company has placed an order with Allis-Chalmers Company for four No. 5 style "K" Gates gyratory crushers. Two of these will be arranged for crushing limestone and two for shale.

LONG BELT CONVEYOR.

Warton, Ont., Can., June 20.—Last month the plant of the Crown Portland Cement Company commenced active operations in the manufacture of cement from rock. Previous to the taking over of the plant by the present company, marl was used.

Last year extensive alterations were made, new, up-to-date machinery being added, and a system of labor-saving devices put in.

For loading and unloading boats an immense belt conveyor, the longest in the world, runs from the company's dock to the extreme end of the plant, the continuous belt being 2,500 feet in length.

TO REDUCE RATES.

At the meeting of the Interstate Commerce Commission recently, the case of the Sackett Plaster Board Company vs. the Buffalo, Rochester & Pittsburg railroad, the commission held that the present rate on plaster board is too high and it is therefore unjust. Plaster board at this time takes a higher rate than plaster, which is discrimination. Lower rates were ordered to New York City, and the roads were further ordered to readjust the difference between the rates on plaster and plaster board accordingly.

MICHIGAN COMPANY ABSORBS.

Grand Rapids, Mich., June 19.—The Grand Rapids Plaster Company, which is one of the largest operating concerns in this vicinity, has taken over the property and business of the Michigan Plaster Company. This company has a large mill at Grandville, Mich., and has been operating for the past three years. Henry Smith, well known in the plaster industry, organized the company and has been manager of it. Mr. Smith and the employees of the company will continue in the same capacity with the Grand Rapids company.

E. L. Willis, manager of the Garden City Fan Company, stated that they had done an enormous business the first six months of this year. They are behind in their orders now 90 days, but hope to catch up soon. Their steel plate fans for heating and ventilation and their blowers, furnishing air under pressure up to five pounds, are increasing wonderfully in popularity and sales. The company's offices have lately been moved to the McCormick building, on the fifteenth floor, corner Michigan Avenue and Van Buren Street.

SAND AND GRAVEL

ECONOMICALLY OPERATED

Plant of the A. Y. Reed Sand & Co., Elgin, Ill., is One of the Finest in the Fox River District.

"To be successful in the operation of a sand and gravel plant, the plant must be built to suit the material produced," said William Supernaw, superintendent of the A. Y. Reed Sand Company, of Elgin, Ill.

This plant is one of the new ones in the Fox river valley and was built last year. The company ran about two months in the season, when they were compelled to close down on account of the weather. This year, it has been running steadily and they have been shipping on an average of twenty-two cars per day, this season.

The plant is located at the north end of the city on the Fox river. The company is owned by A. Y. Reed and his son-in-law, Dr. P. F. Gillette. They own 250 acres of property having a river frontage of about three-quarters of a mile and a depth of 80 rods. On this property is located a deposit of high grade sand and gravel, which, after being stripped, is easily produced.

The plant was designed and constructed by William Supernaw, who is at present operating it. Mr. Supernaw is an old timer in the business in this vicinity. He has been connected with various companies and has, in his time, built four gravel washing plants. Previous to building this plant, he was superintendent of the Richardson Sand Company



WASHING PLANT OF THE A. Y. REED SAND COMPANY, ELGIN, ILL.

at Algonquin, Ill. In the construction of each plant he says he has made great improvements, and this one he considers the best that he has yet constructed. It is an economically operated plant and the thing uppermost in Mr. Supernaw's mind was to secure a plant of simple construction.

In the pit they have a Vulcan steam shovel, which loads from the bank onto a regular sand car. This car has a capacity of five yards and is hoisted up the runway by a Flory hoist. By a patent locking device on this car, it automatically locks itself on returning to the pit. This locks the box on the car so that when the shovel is ready to load the box, it is already in place.

The box is dumped at the top of the incline by a projecting arm and discharges into a hopper which spouts on a belt conveyor. This is constructed at an angle of 23 degrees. It is 126' long and conveys the material to the top of the plant. This conveyor discharges into a hopper where a stream of water is introduced to carry the material through the screens.

The water for this is supplied by a centrifugal pump and flows at the rate of 900 gallons per minute. The force of the water carries the material to the screens. These are the ordinary type of screens and there are four of them. All the material over 1½ inch size is spouted from the first screen to a No. 5 McCully crusher. This crushes the larger sized pieces, discharging on a belt, and the material is conveyed to the original hopper and sent back to the washing plant.

The screens are 4'x12' and size the material as the water flows through them, the material dropping to the bins below as it passes the screens.

As the water and material pass through the fourth



STEAM SHOVEL LOADING CAR IN PIT OF A. Y. REED SAND COMPANY, ELGIN, ILL.

screen, it flows into a tilting box which is an invention of Mr. Supernaw's, and one of which he is justly proud. This tilting box consists of a box suspended in the center with a counter balance on the back. As the water and material flow into the box, the material, being the heavier, settles to the bottom. This box will hold five yards of material. When it is full the weight of the material tilts the box, which opens a valve and the material flows into the storage bins below. The water is carried off by a chute.

Four sizes of gravel and sand are produced at this plant and it is the intention to make two more sizes next year. At present, they are making No. 9, No. 8 and No. 4 crushed gravel as well as torpedo sand.

In constructing the bins, which are of timber, concrete foundations were put in five feet deep with an eighteen-inch wall. As the material is dropped into the bin it rests on the ground, thus taking the load off the walls. The spouts are above the car, so that the cars are loaded by gravity. Each bin holds enough material to fill three cars of thirty-five to forty-ton capacity each, and with the proposed switch through the property it will be possible to load cars at the rate of six per hour.

It requires but seventeen men to operate this plant. The power is furnished by an 80 H. P. Ames, 11x12 engine, with coal for fuel.

The Chicago & Northwestern railroad, which runs on the opposite side of the river, built a trestle across the river and a switch into the property. It is the intention of the company to extend the switch track as soon as they have room for it.

There are about two feet of stripping on the property, which is to be done by means of a scraper engine.

The plant produces a very high grade material and it ships its product over quite a territory. The torpedo sand is especially good, as it contains a variety of sizes, which makes it especially adaptable for concrete work.

WATER TRANSPORTATION.

Chicago, Ill., June 10.—Frank W. Renwick, vice president of the Chicago Gravel Company, has taken title to a tract of eight and seven-tenths acres on Thirty-ninth Street, between Honore and Hermitage Avenues.

The land is on the river, and it is stated that it is the intention of the company to use it in connection with its business.

James A. Hart is president of the company and Roy E. Hammond is secretary. It has been suggested that the present movement is to get a yard on the river in order to ship as much gravel as possible in this way, because of the lower freight rates.



PIT, AND CARS READY FOR SHIPMENT AT A. Y. REED SAND COMPANY, ELGIN, ILL.

NEW BARGE LAUNCHED AT GRAFTON.

Alton, Ill., June 20.—A new barge, one of three contracted for by the Mississippi Sand Company, was launched at Grafton recently. The barge is 90x22 and has five feet depth of hold. It will be used to carry sand. When the three barges are finished the sand company will be much better equipped for business.

OPENS NEW GRAVEL PIT.

Grand Rapids, Mich., June 20.—The Battjes Fuel and Building Material Company opened its new 70-acre gravel pit two miles west of the city on the line of the Pere Marquette railroad.

Sidings have been built to the property and the pit has been equipped with the latest improved machinery for handling and screening gravel. In addition to the usual equipment a large stone crusher has been installed and the company will supply crushed stone as well as sand and gravel, and will thus be prepared to meet any kind of specifications. This will be the company's third pit, the other two being on South Division Street and at Belmont, and its total capacity will be twenty carloads daily.

SAND FOR CANAL AT FULTON.

Fulton, N. Y., June 1.—The McDermott Construction Company, constructing contract No. 10 of the barge canal through this city, has contracted with the Fred Pierce Sand Company for the delivery of 35,000 yards of sand this summer.

SAND COMPANY DESIRES LANDING.

Peoria, Ill., June 17.—A new company to be known as the Peoria Washed Sand and Gravel Company applied to the city council for permission to establish a landing at the foot of Harrison Street. This company includes William Swords, Jr., and H. K. Patch. They have chartered the



TILTING BOX IN WASHING PLANT OF A. Y. REED SAND COMPANY, ELGIN, ILL.

steamer Beder and have equipped two barges as a sand pumping outfit. They expect to pump sand from the bed of the river, haul it to Harrison Street and there transfer it to wagons for delivery. The council referred their request to the committee on railroads and harbors.

The Miner-Thornton Company has been incorporated at Brooklyn, N. Y., to manufacture and deal in, quarry and prepare for market, clay, sand, pumice, talc, etc. Capital stock, \$100,000. Incorporators, H. M. Miner, J. C. Thornton, N. N. Goodlett, Jr., all of New York City.

The Collieries Sales Company has been incorporated at Rock Island, Ill., with a capital stock of \$20,000, to deal in fuel, sand, gravel and general builders' supplies, by Morris Geismar, J. D. Miller and B. D. Connelly.

The Miami Sand Company has been incorporated at Cincinnati, O., with a capital of \$10,000, by Thomas P. Greenhow and others.

The Block Forty Sand Company has been incorporated at Denver, Colo., with a capital stock of \$10,000, by John H. Gower, E. Gower and James Grafton.

The Great Northern Sand & Stone Company has been incorporated at New Castle, Ind., with a capital stock of \$20,000.

The Central Gravel Company has been incorporated at Indianapolis, Ind., with a capital stock of \$5,000, by H. E. Helm, H. M. Gentry and Fred K. Shepard.

INSTALLED ECONOMIC PROCESS.

The E. T. Durden Sand Company, Saulsbury, Tenn., operates an extensive sand deposit which is located on the Chattanooga & Memphis division of the Southern Railroad about 58 miles from Memphis. For several years the bank has been operated by means of shoveling and hand screening. Recently a complete and modern equipment, built by the Stephens-Adamson Manufacturing Company, of Aurora, Ill., was installed to economize in the process of reclaiming and handling the material and now it is easy for them to produce thirty cars per day or more in case of a rush.

The deposit is unique in the fact that it is a comparatively poor silica sand and runs to a wide variety of sizes so as to make it particularly suitable for concrete work as well as for building and plastering purposes. The company has been in existence for several years and has shipped their sand into Memphis, Nashville, Chattanooga and Birmingham markets



PLANT OF THE E. T. DURDEN SAND CO., SAULSBURY, TENN.

besides many points between these principal commercial centers.

The company consists of E. T. Durden, Mrs. E. T. Durden, and Capt. J. T. Wilson. Backed with a practically exhaustless supply of the most excellent material and reaching such important markets the company has a splendid business proposition.

RECEIVED NINE CARS OF MACHINERY.

Port Jefferson, N. Y., June 15.—The Dyett Sand Lime Brick Company recently received nine cars of machinery for their plant. Among the shipment were three 450 H. P. boilers and a 450 H. P. engine. Another shipment of twelve cars is on the way. The company expect to have the plant in operation next month.

The Summit Sand & Gravel Company has been incorporated at Terra Haute, Ind., with a capital stock of \$10,000, by N. E. Nattkemper, David M. Wallace and Louis D. Leveque.

The New York Sand & Gravel Company has been incorporated at Seranton, Pa., with a capital stock of \$10,000.

The Washed Sand & Gravel Company has been incorporated at Minneapolis, Minn., with a capital stock of \$50,000, by Francis M. Henry, William Henry and S. R. Child.

The Paterson Sand & Pressed Stone Company has been incorporated at Paterson, N. J., with a capital stock of \$35,000, by George W. Cuso, Philip R. George and Joseph Formanns.

The Wynnewood Sand & Gravel Company has been incorporated at Wynnewood, Okla., with a capital stock of \$6,000, by M. A. Hasenflu, N. C. Hasenflu, Don A. Cochran and F. O. Cochran.

The American Sandstone Brick Machinery Company, Saginaw, Mich., have been very active in supplying demands upon them lately, and have equipped many plants with their machinery. They believe that the outlook for sandlime brick this year is excellent. They recently shipped a 2-press plant to Saskatoon, Sask., Canada, and have also contracted with the Sibley (Mich.) Brick Company to double the capacity of that plant.

The Grande Brick Company, Grand Rapids, Mich., is meeting with such success that it is obliged to operate its plant 13 hours daily. A number of improvements are being made, including a new hardening cylinder, increasing the capacity of the plant one-third.



National Lime Manufacturers' Association

Meets Semi-Annually.

OFFICERS.

William E. Carson, Riverton, Va. President
Charles Weiler, Milwaukee, Wis. 1st Vice-Pres.
Walter S. Sheldon, Hamburg, N. J. 2nd Vice-Pres.
Geo. J. Nicholson, Manistique, Mich. 3rd Vice-Pres.
C. W. S. Cobb, St. Louis, Mo. Treasurer

EXECUTIVE COMMITTEE.

William E. Carson, ex-officio; Chas. Warner, Wilmington, Del.; J. King McClannahan, Jr., Hollidaysburg, Pa.

A VISIT TO COL. W. A. RAUPP.

Peirce City, Mo., June 20.—The ROCK PRODUCTS representative paid a flying visit to the Peirce City White Lime Company, whose plant is located just outside of the city. Col. William A. Raupp, the genial proprietor, said that business was away ahead of last year. Spring business opened up very much earlier than usual and the demand for high grade lime is as great as ever. Col. Raupp is stripping preparatory to joining the two quarries. This will give him an open face of stone approximately 1,000 feet in length. This limestone is of the Burlington formation and contains 99.28 calcium carbonate. At the present time he is running three kilns and the product of the plant is widely sought after by plasterers and contractors desiring a pure white high calcium lime.

The colonel has discarded the wooden hoop entirely, using only the steel and wire. It makes a very neat package. He is a great believer in system and has probably one of the finest systems for determining costs to be found anywhere. Throughout the quarry and kiln room, he has installed registering boxes so that he can determine the exact time when the men arrive, when the cars are loaded, when they are empty, when the kiln is fired, when the kiln is drawn and when the men quit. This record enables him to figure down to mills the exact cost of quarrying and manufacturing. There is no possible chance to go wrong with such a system. Each man's work stands out for the day so that the shirk and the laggard are readily caught up with. If anything goes wrong in any part of the plant it is shown at once on the register. These slips when they are taken from the register at night are very interesting, as they form a series of documents which when filed shows to the minutest detail every item of expense in operating the plant.

Had the ROCK PRODUCTS correspondent arrived a day earlier he would have been treated to a real old fashioned cyclone which tore through one end of the town. Fortunately no lives were lost, but the property damage was considerable. Col. Raupp explained that if he had known that the correspondent was coming he would have postponed the cyclone for another day. The correspondent was somewhat at a loss to understand just how to take this witticism. The genial colonel escorted the scribe to the scene of destruction. This is the second cyclone which has visited Peirce City. The first one cut across one end of the town and the last one the opposite end. The residents are wondering now whether the next one will go through the middle.



PEIRCE CITY WHITE LIME COMPANY'S PLANT AT PEIRCE CITY, MO.

Col. Raupp's new E. M. F. touring car is his latest hobby. He has established records for speed all through the country. Peirce City being a dry town and Monett being the closest watering place, the record time for the car between Peirce City and Monett, a distance of six miles, has been brought to twenty minutes. No time is wasted between drinks, the car going back to Peirce City on record time always, except when a tire happens to go wrong.

During the recent aviation meet at Joplin, the colonel took the trip down there and was an interested spectator. While he is not ready to purchase an aeroplane as yet, it is safe to say that the colonel will get the first one to come into the district. He ought to be able to establish better records between Peirce City and Monett with this method of locomotion.

The colonel's baseball team is badly demoralized, as the boys soon develop into first class players and are taken by the leagues. The colonel, however, has a bunch of raw recruits which he is rapidly getting into fine form and they will soon be able to play all the neighboring towns. Col. Raupp plays in all positions himself and might be called a general utility player. He offered the ROCK PRODUCTS correspondent the job of umpire, but the position was kindly declined, the correspondent not having any too great an amount of life insurance besides having family ties.

PREPARING TO EXPAND.

Spokane, Wash., June 18.—The Idaho Lime Company is preparing to move from its present warehouse, at Sprague Avenue and Division Street, its headquarters for business in this city, to a new location at Pearl Street and Augusta Avenue. At the new location a new warehouse, to cost between \$20,000 and \$25,000, will be erected as soon as the Great Northern is ready to extend its S., F. & N. spur to the site.

To provide for the erection of the warehouse and to enable the firm to make other desired improvements and to add to its working capital, \$50,000 additional bonds will be floated. The Union Trust Company will act as trustee for the floating of this issue.

The new warehouse will be of solid brick construction, about 50 by 100 feet. It is expected that it may be completed and made the headquarters of the company in about three months.

Extensive improvements are also being made at the limekiln of the concern and a general expansion of business is expected to follow.

WILL START SOON.

Apollo, Pa., June 10.—The Apollo Lime and Ballast Company will soon have their plant in operation, east of town, for the purpose of manufacturing lime, limestone and ballast. The buildings consist of a kiln building, a power and engine house, a crusher building and a screen building. The plant will consist at the beginning of two improved Shoop kilns, two 100 H. P. boilers, a Sullivan air compressor, one 150 H. P. engine, a No. 6 Austin gyratory crusher and screen, and will have a daily capacity, when in full operation, of about 500 tons of stone or ballast and 20 tons of burned lime.

The company is organized with a capital stock of \$50,000. The officers of the company are: John S. Lambing, president; W. L. George, vice president and manager; and Charles P. Wolfe, secretary and treasurer, and these with R. M. McLaughlin constitute the board of directors.

The Birmingham Lime & Plaster Company's plant, North Birmingham, Ala., was burned recently. Loss, \$10,000.

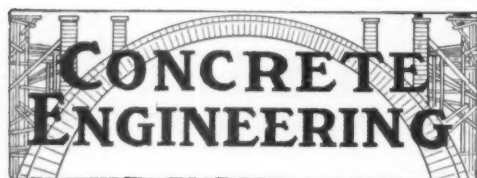
An amendment to the articles of incorporation of the Hovey Brothers Lime Company, Salt Lake City, Utah, was filed changing the name of the corporation to the Utah Lime Company.

W. M. Hardy, Rome, Ga., has a lime plant for sale. Capacity, 450 barrels lime and 8 cars crushed stone daily.

The Black Marble Lime Company has been incorporated at Enterprise, Ore., with a capital stock of \$50,000, by C. V. Christy, George Houser and D. Baughman.

The Rochester Composite Brick Company, Rochester, N. Y., state that the volume of business done in the last six months of 1909 was the greatest in its existence for a like period. Prospects are bright for a splendid business in 1910.

The Consolidated Stone & Gravel Company, of Shelby county, Tennessee, has changed its name to the Memphis Stone & Gravel Company.



JUNE 28 TO JULY 2.

American Society for Testing Materials Will Hold Forth at Atlantic City.

As previously announced the thirteenth annual meeting of this society will be held at the Hotel Traymore, Atlantic City, N. J., on Tuesday to Saturday, inclusive, June 28 to July 2, 1910. Special rates on the American plan have been secured for members of the society and their guests.

The rapidly increasing membership, and each meeting surpassing the last in point of attendance, is indicative of the importance and interest that is being taken in the indispensable work of the society.

The program, which Secretary Marburg has already sent out to the entire membership, is replete with papers by the nation's most eminent engineers and scientists upon topics that are timely and essential to further progress in the study of the material of construction. No one of the sixty-four numbers on this program can be overlooked by he who would be abreast of the times.

The session devoted to cement and concrete will be held on Thursday, June 30, at 10 a. m., and will comprise the following numbers:

26. Report of Committee on Standard Specifications for Cement. George F. Swain, chairman.
27. Aluminates: Their Properties and Possibilities in Cement Manufacture. Henry S. Spackman.
28. The Effect of Sodium Silicate Mixed with or Applied to Concrete. Albert Moyer.
29. Comparative Tests of Lime Mortar, both in Tension and Compression; Hydrated Lime and Sand, Lump Lime and Sand, and Cement Lime and Sand. E. W. Lazell.
30. Tests on Reinforced Concrete Columns Subjected to Repeated and Eccentric Loads. M. O. Withey.
31. The Distribution of Stress in Reinforced Concrete Beams, Including a Comparative Study of Plain Concrete in Tension and Compression. A. T. Goldbeck.
32. A Sand Specification and Its Specific Application. W. A. Alken.

Recreation periods are provided for Wednesday afternoon and Friday evening, and on Thursday evening is the popular "Engineering Smoker."

On Wednesday evening a memorial session will be held in honor of the memory of Dr. Charles B. Dudley, late president of the International Association for Testing Materials and of the American Society for Testing Materials.

THE LIFE AND LIFE-WORK OF CHARLES B. DUDLEY—1842-1909.

R. W. Lesley, vice-president of the society, will say an opening word on behalf of the executive committee. As a Railroad Man, Theodore N. Ely. As a Chemist, Edgar F. Smith. As a Metallurgist, Henry M. Howe. As a Mentor, B. W. Dunn. As a Citizen, W. H. Schwartz. A Personal Tribute, R. W. Hunt.

BUILDING PLANT IN MEXICO.

Jeffersonville, Ind., June 21.—The Louisville Cement Company, which employs two hundred men at its natural and Portland cement plant at Speeds, ten miles north of Jeffersonville, is preparing to carry out its invasion of Mexico, which is said to have been the territory almost exclusively of Germans, the latter having hold of most of the concessions in that country. It has been found impossible to import cement there to compete with the foreigners, and the Louisville company is now building a plant a short distance south of the City of Mexico, at Tula, Hidalgo. The skilled labor will be exclusively American.

WORK UNDER WAY.

Hudson, N. Y., June 20.—The new rock mill to be built at the plant of the New York & New England Cement & Lime Company will be completed this summer. Ground has been broken and the work of construction is under way. The output of the plant will be greatly increased when the second rock mill gets in operation.

WILL REORGANIZE.

Allentown, Pa., June 20.—At the trustee's sale at the plant near Bath recently, the works of the Penn Allen Cement Company, of Allentown, were bought by Frank Jacobs, attorney, for approximately \$500,000, including bond issues of \$450,000 and accrued interest.

The purchasing attorney represents a coterie of Philadelphia and Allentown investors, whose plan is to reorganize and operate as quickly as possible.

THE LONGEST

Unreinforced Concrete Arch in the World, in the Rocky River Bridge at Cleveland Described in Detail—Great Engineering Feat.

By A. M. Felgate, County Bridge Engineer.

The concrete bridge carrying Detroit Avenue over the Rocky River has attracted considerable attention from engineers, both in Europe and America, on account of several features which mark an advance in the design and erection of concrete arches. These features comprise the design of the main arch with a span of 280', the method of raising the compressive strength of the concrete by the introduction of embedded stone slabs, and the arrangements for the centering used during the erection of the main arches.

The site of this bridge is about seven miles west of the public square in Cleveland and about one-half mile from the mouth of the river in Lake Erie. The banks at this point rise about 100' on each side of the water. They are composed of a laminated shale, which disintegrates very quickly under atmospheric influence. A few feet from the surface this shale is very hard and while not equal to living rock as a foundation, its bearing value is very high. These conditions were particularly favorable to the construction of an arch, as the horizontal thrusts could be provided for very satisfactorily. The location of the bridge, in a section of the city which comprises high class residence property, demanded that attention be paid to the architectural effect.

The bridge has a total length from abutment to abutment of 708', embracing the 280' central span, with three 44' approach spans at the west end, and two similar arches at the east end. It will carry a 40' roadway, with two car tracks 11' centers, and two 8' sidewalks. The roadway is designed for 60-ton cars and the sidewalk for 80 pounds per square foot.

The 280' arch consists of a pair of plain concrete ribs, each 22' wide by 11' thick at the springing line and tapering to 18' in width by 6' thick at the crown. These ribs have no steel reinforcement, and the span is the longest concrete arch of its type in the world at the present time. Other arches of longer span, both in reinforced and plain concrete, have been projected, but with the exception of a bridge now in course of erection in New Zealand, they are still in the preliminary stages. Long span arches of this type demand certain conditions of foundations and facilities for erecting the falsework before such designs can be considered. A rocky gorge with a rock bottom is the most desirable site. The horizontal thrusts from one of the Rocky River ribs is 3,110 tons and the vertical reaction is 5,450 tons, which includes the weight of the pier over the abutment. When it is remembered that the least settlement, either vertically or horizontally, would result in unsightly, and perhaps dangerous cracks, it can be readily seen that the problem of providing for such large stresses demands great care and judgment. Under conditions where it is probable that there may be some slight settlement, it is preferable that the arch be hinged at the springings and the crown. Any settlement would then result in a lowering of the crown and there would be no tendency to crack the arch. The introduction of hinges is not desirable, as their use militates against the permanency of the bridge, the steel pins being difficult to protect against corrosion.

In the present case, the choice of a single arch span, flanked by arched approaches, instead of a two or three span structure, was determined by practical considerations. The water being on the lake level, there is a

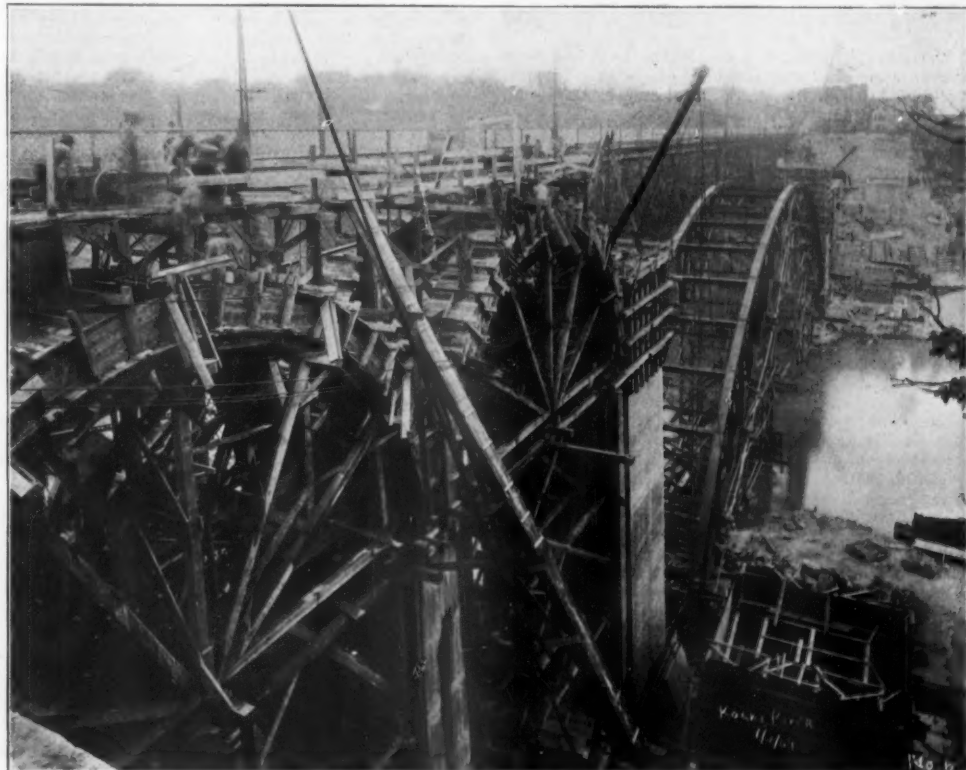
tendency of the ice to form large hummocks, and this frequently dams the water back in the upper reaches of the river. A sudden thaw sometimes intervenes and the glacier-like mass moves out into the lake, often doing considerable damage to property on the banks or flats. Piers in the river would increase this danger. The benefit of a clear waterway was forcibly demonstrated this winter, when a heavy rain and thaw broke up the ice dams. There was no tendency of the ice to collect above the bridge. The next consideration was that of comparative cost and careful preliminary plans and estimates made for 100' spans showed that the cost would be approximately the same as for a single span. Another consideration was the favorable condition of the location for a single arch. It was also possible with a single span to evolve a design of a monumental character, the dignity of which would be commensurate with the requirements of the locality. These considerations seemed conclusively to favor the single span design and it was therefore adopted.

The type of bridge is known as the Luxemburg construction, the essential feature of which is two comparatively narrow bridges placed side by side and about 18' apart in the clear. This space is bridged over by the roadway. The Walnut Lane bridge in Philadelphia is a notable example of this type of construction. This parallel twin construction is carried all through the main arch span, piers and approach spans. The piers are made in two halves connected with a curtain wall, forming a portal; each half pier being made hollow, in order to save material. For 50' each side of the crown the spandrel space over each main arch is filled by two parallel solid spandrel walls, one on each side of each rib. The reason for not continuing the spandrel arches over the crown is based on the esthetic requirements of arch design. The distance from the soffit at the crown to the top of the roadway should be made as small as possible, in order to enhance the lightness of the design. This also increases the effective rise of the arch. As the horizontal thrust at the spring line is directly proportional to the rise, the advantage is obvious.

The spandrel walls mentioned above are continued each side of the crown as spandrel arches, each composed of a single rib supported on piers resting on the main rib. These piers are braced transversely by curtain walls. The approach arches are similar in construction to that of the spandrel arches, all being ribs supported by ordinary piers.

This type of construction saves about 30 per cent of material over the solid arch. The tendency of engineers at the present time is to carry this idea still further and approach as near as possible to the skeleton type of construction. This tendency is laudable so long as the fundamental principles of concrete construction are not violated. Concrete has a high value in resisting compression but for tensile stresses it is useless. Therefore all designs of a skeleton nature should be of such a character that the main stresses are compressive, the only tension being that due to flexure in the slab and beam construction. The attempts that have been made to construct bow-string and Warren girders in reinforced concrete are opposed, in the writer's opinion, to good practice.

As already noted, one of the distinguishing features of this bridge is the method of reinforcing the main arch concrete by embedded slabs of stone. These stones were placed radially and separated by a space of about 6". About 35% of the entire volume of the main ribs is composed of this stone. Great care was necessary in placing these slabs and filling the interstices with the concrete so that no voids were left. The purpose of these slabs is primarily to strengthen the compressive resistance of the concrete. The economy in this case was not very great, owing to the care necessary in keeping the slabs radial. As some of these slabs were over 6' long, 4' wide and a foot thick it can be readily seen that considerable time was required to place them correctly. In the heavy foundations under the main piers these slabs resulted



CLOSE VIEW OF THE FORMS FOR ONE HALF OF THE TWO LAST APPROACH SPANS OF ROCKY RIVER BRIDGE.

in considerable economy. When concrete cubes are tested to destruction it is seen that failure generally comes by diagonal shear. If some resistance in the form of steel or flat stones is introduced normal to the shearing stress the ultimate strength of the construction is theoretically increased. A column is considerably stronger when the vertical reinforcement is hooped at close intervals. An arch ring is virtually a column, with the addition of extra stresses induced by unsymmetrical loading. At the spring line these eccentric stresses become excessive for plain concrete, and as it seemed impracticable to increase the thickness of the arch ring some form of reinforcement was necessary. Steel placed radially to restrain the concrete laterally would accomplish this, but the same effect is obtained in a more economical manner by the use of radial slabs. These slabs unite very closely to the surrounding concrete, the precaution being taken to wash all stones with a hose before placing them in position. In the course of construction it was necessary to cut down the shelf carrying the steel centers, and wherever a float was encountered the concrete and stone broke on a common cleavage line, showing that the bond between them was perfect.

The stresses in the main arch were determined by the graphical analysis known as Cain's method. They were checked independently by algebraic methods, and found to agree very satisfactorily. This type of arch, with its open spandrels, and the absence of an earth fill with the attendant uncertainty of the horizontal pressure, is the most favorable form to apply the somewhat complicated methods of stress analysis. The external loads are definite in position and direction, and it follows that for any given arch of this type there can be but one shape of arch to resist, without eccentricity, these stresses. In an arch with an earth fill the curve of the arch is not equally determinate, as the intensity and direction of the superposed earth is unknown. The usual assumption that the earth acts vertically, while probably the best that can be made, is far from correct, unless the arch is very flat. As the indeterminations are all on the side of safety their neglect is not a serious matter.

The assertion made above that only one curve of arch can be used for bridges of this type can be very easily exemplified by the following experiment. Conceive a loose cord, say about 10' long, attached at each end to posts driven into the ground to equal heights. Along this string at equal intervals suspend weights symmetrically about the center between the posts. The cord will

deflection formula for beams, but a closer approximation to these stresses could now be made, as the observations in the field show clearly the movement of the arch due to change of temperature. From these observations it is found that the crown elevation of this arch has a difference of 1 1/4 inches between winter and summer temperatures. This causes the extreme fibers to elongate or compress in a definite ratio and the elongation or diminution in length is a measure of the actual stress due to the deformation. The accuracy of this method depends upon the correct determination of the coefficient of elasticity of the concrete.

The combined stresses for all possible conditions produce their greatest effect at the springings of the main arch—where the unit stress is 566 pounds per square inch. Numerous tests of the concrete, made during construction, show that for 30 days old 6" cubes developed an average compressure of 2,400 pounds per square inch, so that a factor of safety of four is obtained. As the age of the concrete increases this factor would probably be increased to five.

It is by no means certain that the stresses obtained by the graphical method of analysis here adopted are the actual stresses existent in the arch. The assumptions that have to be made to adapt the fundamental theorems pertaining to the elastic arch to a drawing-room proposition have some signification in detracting from that confidence which engineers have in the results of statically determined problems. However, the experiments undertaken by the Austrian government and the successful results obtained in many hundreds of arches designed by this method justify the assertion that the formulas are reliable.

It has been remarked that more real engineering progress is evidenced today in the methods of construction than in the design of the works themselves, and this is exemplified very clearly in the construction of this bridge. The problem of turning an arch of this size over a stream subject to the conditions previously described, demanded exceptional skill and judgment. The county prepared designs for these centers, but their adoption by the contractors was not insisted upon, the county reserving the right to approve of any alternate plan that might be submitted. The contractors' consulting engineer, Wilbur J. Watson, finally evolved a design the essential features of which was a three-hinged steel arch, which utilized the steel beams afterwards used as floor beams carrying the street car tracks. An examination of the stress sheets for these centers reveals the fact that only the radial component of the vertical weight is resisted by the steel arch; the tangential component being carried to the abutments by the concrete itself and a system of wooden bows. The deformations of this steel arch, under different conditions of loading and temperature, were accurately calculated, and a system of loading the centers evolved, so that these movements produced no cracks in the arch. This system consisted of depositing the concrete in large voussoir sections, separated by a key space of 4". Concrete struts were built in this key space of sufficient capacity to carry the tangential component of the load, or, in other words, to prevent the concrete from sliding down the centers. The two trusses comprising the three-hinged steel arch were each constructed with a two-inch camber. This camber was taken out under the loading and the arch was built to the actual curve called for on the drawings.

In placing the concrete the crown was first heavily loaded, and the crown deflection of the steel was about 1 1/4 inches, the quarter points rising proportionately. The placing of the succeeding sections overcame this condition and caused the quarter points to recede to their true position. When the sixth pair of voussoirs were in place the center pier had risen one inch and all the camber had been taken out of the steel trusses.

The efficiency of the struts between the eleven sections in which each rib was built was demonstrated very conclusively while the work was in progress on the fourth pair of sections. The concrete of the skewback section (2) and the lower half of the next section above it was found at that time to be entirely free from form. This condition was due to the conditions described above, the steel centering at the quarter points, which had been deflected upward by the load on the crown, now receding to its original position. This showed that the concrete struts in the key-space acted as hinges, exactly as they had been designed. The lower pair of sections did not tip forward on the skewbacks, nor was the bond along the skewback line broken at any time.

After the eleven voussoir sections were finished the key spaces were filled with a concrete composed of one part Alma cement, one part sand, and two parts crushed limestone. This was a richer mixture than that used for the arch. The lower two spaces were filled first, then the second pair, and so on until the crown was reached. The key space at the crown had no struts, and the condition was exactly the same as a stone arch ready to receive the keystone. The temperature movements of the crown pier had been under constant observation and it was found that for a rise of approximately 30 degrees the pier raised one-quarter of an inch. It was therefore decided to leave a joint at this key and the sides of the key space were oiled with linseed oil to prevent a bond in the concrete. The United States weather bureau was consulted and a time was chosen to key the arch when the temperature could be expected to remain stationary for about two days. After this key was cast the temperature did remain stationary for two days and then rose very considerably. The crown of the steel centering came up with the temperature, with the result that the joint at one side of this key opened about one-quarter of an inch. This joint remained free from that time until the steel centers were lowered, showing that the entire radial component of the arch was taken by the steel centers. The concrete in the arch rib was twenty-eight days old when the centers were removed, while that in the last key had been placed only nineteen days. Tests of cubes of the two mixtures showed that the 1:2:4 concrete had a strength of 3,100 pounds per square inch when thirty days old, while the 1:1:2 mixture in the keys crushed at 3,200 pounds per square inch when only seven days old. At the same time the stresses in the rib due to its own load did not exceed 250 pounds per square inch. The conclusion therefore was reached that it would be possible to lower the centering with safety and thus permit the construction of the second arch rib before cold weather. The employment of the rich mixture in the keys, and the manner in which the work was conducted enabled the early removal of the centers and the construction of the second rib was completed early in November. This allowed the river to be entirely cleared of all falsework, and the floods and ice jams which occurred in January caused no trouble to the contractors, although much damage was done to surrounding property.

The concrete in the keys, with the exception of the one at the crown, was mixed very wet to insure that the struts between the sections were thoroughly surrounded. The rich mixture was employed not only to develop

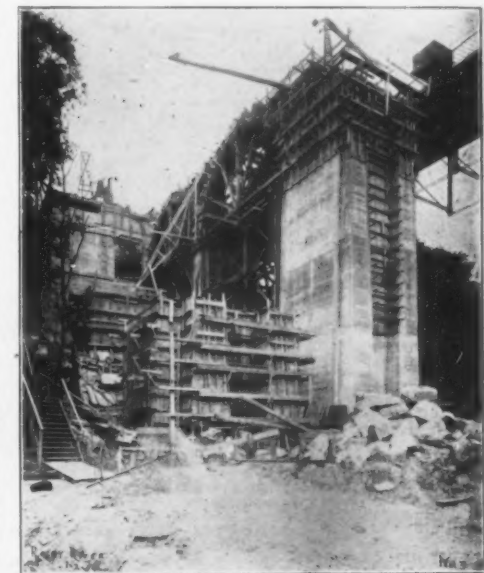
strength quickly but also to make it equal in strength to the concrete containing the large stones. The concrete for the key at the crown was mixed comparatively dry, and thoroughly rammed into place. The top of this key was built up somewhat higher than the extrados of the adjoining sections and loaded with about ten tons of slab stone to retain the dense mixture secured by the ramming. This load was removed the day after the key was cast and the concrete cut down to the line of the extrados.

To determine how closely the actual curve of the intrados corresponded to the theoretical curve, readings were taken on the lagging and a profile of the latter made before the centering was lowered. This profile showed that the crown was in exactly the right position, while the maximum variation at the quarter points was less than one-half inch. The length of the actual curve was within one-half inch of the theoretical length. When the wedges under the centers were struck the arch settled 0.028 feet at the crown and 0.006 feet at the quarter points.

The arrangement of the bearings for the steel centering was designed to insure easy manipulation for the process of lowering and moving the trusses. The shoes rested on a nest of rollers and two sets of rollers placed vertically resisted the horizontal thrust. Specially designed steel wedges operated by screws enabled the center to be lowered evenly and rapidly. A track was laid on a shelf projecting from the footings of the main pier, and a block and tackle pulled the trusses over to the new position with little trouble.

Special attention has been devoted to securing a finish on the exposed surfaces of the concrete that would be uniform and in keeping with the monumental character of the structure. A facing mixture consisting of one part cement to four parts granite screenings is placed along the exposed surfaces as the concrete is cast in the forms. Steel plate separators are set against the forms so that the facing mixture may be poured simultaneously with the concrete. The separators are drawn upward as soon as the facing mixture is poured in order that the mixture may bond with the concrete. After the forms are stripped the surfaces are bush-hammered and then washed with a dilute solution of hydrochloric acid, which exposes the grit of the granite facing. The results are quite satisfactory.

The plans for the Rocky river bridge were prepared by the bridge department of the county engineer's office, under the direction of the writer. At that time A. B. Lea



HALF OF EAST MAIN ARCH PIER OF THE TWO EAST APPROACHES, ROCKY RIVER BRIDGE.

was county engineer. On September 6, 1909, F. R. Lander succeeded Mr. Lea. A. L. Stevens is resident engineer in charge of the construction of the bridge for the county. The contractors are Schillinger Brothers of Columbus, and the contract price was \$208,000, based on the preliminary estimates. Owing to changes in the foundation plans, necessitated by the character of the excavations, this figure will be increased slightly. Wilbur J. Watson is consulting engineer for the contractors.

NOTE.—Alma Portland cement used in the construction of this bridge furnished by the Cleveland Builders' Supply Company. Crushed slag and aggregate furnished by Cleveland Macadam Company.

The Springfield Concrete Post Company, of Springfield, Mo., has been incorporated. Capital, \$50,000. Incorporators—Lewis Brown, Barney Thrall, J. T. Woodward and others.

The Higgins-Albers Concrete Form Company, of St. Louis, has been incorporated. Capital stock, \$100,000. Incorporators—R. B. Wiggins, Herman Albers and John A. McRain.

The Acme Tiling and Concrete Company, of Paragould, Ark., has been incorporated with capital stock of \$25,000, to manufacture tiling and all kinds of concrete blocks. The officers are: A. Bertig, president; T. G. Woody, vice-president and general manager; H. S. Trice, treasurer; and D. D. Hodges, secretary.

The Ohio Concrete Block & Tile Company, of Ohio, Ill., has been incorporated by W. E. Sharp, O. J. Connor and Dr. D. W. Allen, all of Ohio. The company will manufacture concrete blocks, brick, porch pillars, chimney blocks and tile.



A. L. STEVENS, ENGINEER IN CHARGE OF ROCKY RIVER BRIDGE, CLEVELAND, O.

then assume a definite position which is the equilibrium curve for that system of weights. If the horizontal force tending to pull the posts inwards is measured the curve can be reproduced exactly on paper by using that force as the pole distance in the force diagram. The cord can only take tension, but if a material capable of resisting compression be substituted and the whole system revolved 180 degrees the polygon now becomes an arch with the stresses now in compression and in perfect equilibrium under the assumed loading. The force which in the first case tended to pull the posts inwards now pushes the posts outwards, and this is the horizontal thrust exerted by the arch.

In the assumptions made for calculating the stresses the concrete in the main arch ribs was assumed to weigh 160 pounds per cubic foot, and all other concrete 150 pounds per cubic foot. The safe compressive strength of the concrete was assumed to be 600 pounds per square inch. The 60-ton street cars were assumed to produce for each half of the bridge to one side of the center line an equivalent uniform live load as follows: For the first 10' width of roadway next the center line 270 pounds per square foot, for the next 10' of roadway 100 pounds per square foot, and for the 8' sidewalks 80 pounds per square foot. The wind load was assumed to be 30 pounds per square foot of vertical surface.

Determinations for stresses were made (1) for dead load stresses; (2) for dead load plus live load stresses; (3) for dead load plus one-half live load stresses; (4) for dead load of arch ribs spandrel piers and walls; (5) for temperature changes; (6) for stresses due to shortening of the arch from thrust; and (7) for wind stresses.

The determination of stresses under (4) was made on account of the method of construction as the centers under one rib were lowered when the first rib and secondary piers were completed. For the determination of the stresses for dead load eight different stress diagrams were made in the search for the true pressure line. The tables and diagram show that this pressure line follows very closely the center of gravity of the arch ring. The temperature stresses were figured by the

STUCCO

By Albert M. Moyer, Assoc. Amer. Soc. C. E.

The history of stuccoes does not furnish sufficient information and data to be of practical value in the manufacture of the present day Portland cement stuccoes. There are records standing 350 years B. C. of stuccoes made of vastly different material than are of economical use at the present time, and we find that such stuccoes were almost invariably used in the warm climates where the action of frost would not tend to disintegrate the rather poor material which was then available.

There is every reason to believe that originally these stuccoes were intended to cover up and protect inferior building stone and sunburned straw brick. The archaeology of stucco would tend to show that from an artistic standpoint this method of decoration was a development of the wattle buildings, which were plastered with clay and different muds hardened by being baked in the heat of the sun. Therefore, in this instance, the use of clay plaster over wattle houses was to protect an inferior building material.

Today stucco is used for similar purpose, that of protection and pleasing surfaces. It would, therefore, seem advisable to recommend a material which would best serve the purpose of protection and artistic merit. Stucco or plaster should never be used as an imitation of other building material.

"To cover brick with plaster and this plaster with fresco is perfectly legitimate, the plaster is gesso grounds on panel or canvas, but to cover brick with cement and to divide this cement into joints that it may look like stone, is to tell a falsehood, and is just as contemptible a procedure as the other is noble."

To carry out these ideas we desire to recommend only Portland cement stucco for exteriors, as this is the only hydraulic material which will stand the action of the elements.

From the artistic side we would also recommend such surface finish for stucco as will cause both natural color and pleasing texture. It would be well, therefore, to expose to view the aggregates used and avoid as far as possible exposing the bonding material, Portland cement.

There is no artistic reason for allowing only the bonding material to be displayed to the eye. On very large jobs the surface can be cleaned off by means of a sand blast, and on smaller jobs the surface may be cleaned, exposing each grain of sand, by means of muriatic acid in dilute solution, 1 part commercial muriatic acid, 4 to 5 parts clear water.

Where white aggregates are used the surface may be cleaned off with a solution of sulphuric acid, 1 part acid, 4 to 5 parts clear water. The sulphuric acid leaves a white deposit and therefore should not be used excepting where the aggregates are white.

Another method is to scrub the surface while yet green, say within 24 hours, with a house scrubbing brush and clear water. This is more difficult than the others for the reason that if the stucco is allowed to remain too long before scrubbing, it will be too hard to remove the coat of neat cement from the outside of each particle of sand or other aggregates; and if scrubbed when it is too soft the surface may be damaged and difficult to repair.

If the character of the available aggregates will not present a pleasing surface when exposed, the following surface treatment may be used:

While the last coat is still thoroughly damp, apply a Portland cement paint composed of 1 part Portland cement, 12% of the volume of the cement of well hydrated lime, pulverized iron, and 1 part of the volume of the cement of fine white sand. Mix with water to the consistency of cream or the ordinary cold water paint. Stir constantly and apply by using a whisk broom, throwing the paint on with some force.

Keep this finish surface damp for at least six days, or longer if economy will permit. Do not allow it to dry out in any one place during the week. If necessary protect by hanging tarpaulins and using a fine spray of water, playing on several times during the day by means of a hose. This will give a pleasing light gray color of excellent texture.

Stucco may be applied to various building materials. There is hardly any reason at the present time for stuccoing stone buildings, the procedure at best is difficult and hardly to be recommended. Our building stone is usually an excellent material and, therefore, does not require either protection or covering to produce pleasant effects.

New brick may be covered with stucco very successfully. The joints should be first raked out half an inch. The brick must be saturated with water. It is always best to start stuccoing at the top of the wall and work down between the plasters or corners, finishing a whole strip or whole side wall from top to bottom in one day. Thus no streaks or cracks are formed where one day's work ends and another begins. By this method the wall can be kept wet ahead of the work by means of a hose.

The second coat should be put on as soon as the first coat has stiffened sufficiently to hold in place and stand the pressure of the trowel. This second coat should be well scratched and the finished coat applied while the second coat is damp. The finish coat should then be kept wet, protected from the rays of the sun and as far as possible from drying out. This can be done by hanging wet cloths over same. This rule of keeping each coat moist until the other coat is applied and protecting after applying the finish coat, must be observed in all forms of Portland cement stucco.

If the stucco is to be applied to metal lath or wire cloth the metal should be plastered on two sides so that it is entirely encased in mortar in order to avoid rusting. If this is impracticable then the metal lath or wire cloth should be dipped in a paint made of equal parts of neat Portland cement and water. Immediately after dipping, the metal lath or wire cloth should be tacked onto a frame in the position it is intended to occupy. As soon as the neat Portland cement has hardened on the metal apply the first coat of stucco. Hair should be added to the mortar to be applied on wire mesh or expanded metal. One bag of cement, one pound of hair.

If plaster boards are used they should be nailed on the frame work of the building, leaving at least a quarter of an inch joint between each plaster board. This joint to be filled in with lime putty, otherwise each plaster board will cause square cracks on the outside of the stucco the size of each board.

A convenient method of waterproofing plaster boards is easily available. The boards may be painted with two coats of any of the reputable bitumen waterproof paints to which plaster adheres. Then about 24 hours after the bitumen paint has been applied, and within six days, apply the first coat of stucco.

For stucco on terra cotta blocks great care should be exercised in keeping the blocks thoroughly saturated with water, for if the blocks are not saturated they will

pull the water out of the mortar and it will crack and disintegrate.

Portland cement requires water until it has thoroughly hardened, which ultimate hardening usually takes from 14 days to a month. It is not always necessary to play the hose on the wall for a month, although it would be advisable. The dew of night, the dampness in the atmosphere and the rain will furnish the necessary moisture provided the material on which the mortar has been plastered has not too great an affinity for water.

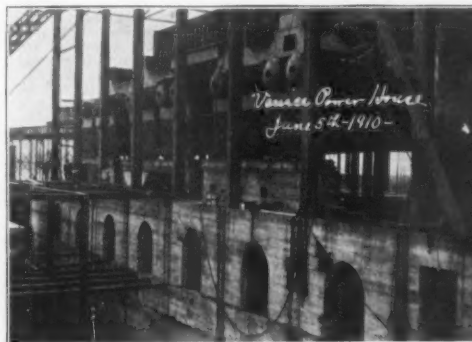
In order to prevent the porous hollow terra cotta tile from sucking the moisture from the stucco and also to furnish waterproofing and an additional bond other than that which would be given by the key, it is good practice to paint the surface of the dry terra cotta blocks after having been erected in the wall with two coats of bituminous paint, equal to such paints as dehydratine, Minwax, R. I. W. or X-Hydro-Plastic. It is important that the first coat of stucco is placed over this paint after 24 hours and within six days.

Proportions for a good stucco should be 1 part Portland cement, 2½ parts coarse clean sand. (If coarse clean sand is not available use only 2 parts of sand.) Add 10 to 15% of well hydrated lime, dry pulverized, of the volume of the cement.

If it is the desire of the owner or architect to use the exposed aggregate method interesting natural colors can be obtained by using the following materials instead of sand, the same proportions: green, red, buff, black or white marble screenings all passing a No. 8 screen and all collected on a No. 40 screen. These different colored marble and different colored sand where obtainable, can be used singly or in a combination. When exposed by scrubbing or the acid treatment, very interesting results are obtained.

In mixing stucco great care should be exercised to obtain the thorough incorporation of cement, sand and the other aggregates. The sand and cement should be mixed together dry until an even color results. This can be done by shoveling and raking while shoveling. Water should then be added, being careful not to add too much water at a time and not to get the resulting mortar too wet so that more sand or cement has to be added. Be very careful to bring the resulting mortar up to the proper consistency for plastering.

It is advisable to add to the mortar from 10 to 15% of the volume of the cement of well hydrated lime. This should be mixed dry with the cement and sand before the water is added. The addition of hydrated lime tends to fatten the mortar, making it more adhesive and impervious.



TRACTION POWER HOUSE AT VENICE, ILL.

Another specification which we believe will prove of considerable value is by the addition of mineral oil to wet mortar. After the water is added and thoroughly mixed with the mortar add 15% of mineral oil and remix. If a light effect is to be produced use white oil, such as Oil Petrole, manufactured by the Chesebrough Manufacturing Co.

When the oil is to be mixed with the mortar it is always advisable to use hydrated lime, as we thus have a larger amount of emulsifying material.

The color obtained by the scrubbing or acid method is limited only to the available sand or marble screenings, the color will be the color of the aggregates. An excellent green can be obtained by adding 8% of the weight of the cement of Chromium Oxide. This should be mixed dry with the sand, cement and hydrated lime.

Always keep in mind that the surface to which the mortar is to be applied must be thoroughly saturated with water, each coat of stucco must be kept moist and the final coat must remain moist for at least one week, and longer if economy will permit.

Stucco should not be troweled to a smooth surface. The artist painter would never think of smoothing the paint on his canvas by means of a straight edge. Texture and color are necessary if artistic results are to follow. By using the suggestions above outlined, the architect is privileged to select the aggregates from which the stucco is made and has in fact as great play in the planning of the color, tone and texture as has the artist in mixing the paints on his palette.

Contractor John Schealer, Boyertown, Pa., is erecting a building near the borough line on South Reading Avenue, to be used for the manufacture of concrete blocks by Eli S. Nagle.

Concrete blocks were used in the construction of the new 875-foot dry dock at Southampton, England, which, although fifty-five feet shorter than the longest existing dry dock, is to be the deepest in the world.

F. H. Davidson is the architect for the new building to be erected by Callaghan & Co. at 401 East Ohio Street, Chicago. It will have a concrete pile foundation.

The plant of the Century Waterproofing Company at East Norwalk, Conn., was recently damaged by fire. Loss, \$2,500.

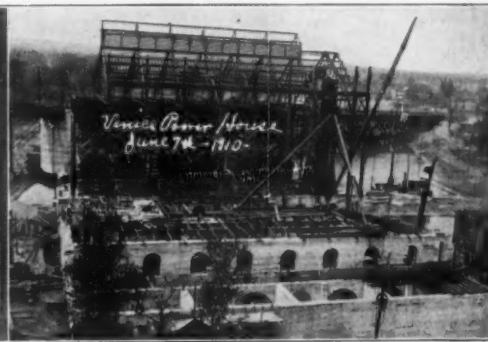
ACTION POWER HOUSE

At Venice, Ill., Presents Many Interesting Features in Its Construction, the Foundation Resembling the Aqueducts of Ancient Rome.

Among the important improvements now in progress on the east side of the Mississippi river is that of the power house for the Illinois Traction System, at Venice, Ill.

The plant is situated on the bank of the river and against the south side of the McKinley bridge, and is, in reality, a part of the bridge. Meeting G. H. Wilmarth, the resident mechanical engineer of the system, and Mr. Henry, of the Meyers Construction Company, of St. Louis, contractors for building the foundations and concrete floors, the following particulars were learned:

The designs for the power house were made by H. C. Patterson, the electrical and mechanical engineer of the system. The power house proper is of steel frame, brick walls and Indiana Oolitic limestone trimmings. It will be equipped with twelve boilers from the O'Brien Boiler Works, of St. Louis. Steel coal bunkers at the top of the building, on a rising grade from the bridge track, admit of being supplied with coal from cars built with traps at the floor. By gravity, the coal runs down spouts to the stoker hopper, and is fed by endless chain grates to the furnaces. The boilers supply steam for the large Hamilton-Corliss cross-compound engine of 1,500 H. P. direct connected with a 1,000 K. W. generator, and also a steam turbine vertical Curtis generator of 3,000 K. W. capacity. There will be two vertical duplex circulation pumps—one 24x35—18 and the other 12x14—18. Worthington



pumps being required for the present units and as more units are installed the pumping capacity will be increased. Two cranes from the Case Crane Company, of Columbus, Ohio, are installed for handling machinery.

The foundations and structure for the tubes being arched in a series in the walls and resemble the aqueducts of ancient Rome, the arches ranging from 9 to 14 feet with a width of 6 to 14 feet. The thickness of the walls varies from 2 to 3½ feet. The work has been done on the arch system, and so massive that but little reinforcement was required. In constructing the foundations, 9,100 yards of concrete were used, most of the crushed stone being supplied by the East St. Louis Stone Company. The foundations are built on 500 Raymond concrete piles, the same as used by the United States government in the foundation for the St. Louis postoffice. Lehigh Portland cement was used on the job.

The United States Cast Iron Pipe and Foundry Company, of Addyston, Ohio, will furnish the four-foot intake pipes leading to the river and the 42-inch cast iron discharge pipes. Under the arrangement devised, very little pumping will be necessary, as the water will practically siphon itself, except during very low stages of the river. The power house is located to a height of twelve feet above the highest water that has been known in the Mississippi river.

On the track near the plant, the Rock Products man was interested in seeing a freight car equipped with an engine and boiler, the smoke stack penetrating the roof of the car and rising ten feet or more. It was being used by the McClintic-Marshall Steel Bridge Company, of Pittsburg and Pottstown, Pa., for air compressing.

It is expected that the power house will be completed and in operation September 1. It will furnish electric power for the western terminals of the traction system and the lines south of Springfield, relieving the Riverton station of the load which it is now carrying south of the state capital with only the assistance of the Edwardsville plant.

Concrete

STRUCTURAL TILE

Made by the Pauly System Being Used in Many Kinds of Buildings with Unqualified Success.

Faster even than the growth of the Portland cement industry itself is the expansion of the business of producing concrete structural tile by the process which is now world famous and known as the Pauly system of manufacturing tile and construction. Scarcely three years ago it was in an experimental stage and only two years ago was the first factory to manufacture this tile started by the inventor upon a commercial basis. At that time the readers of *Rock Products* were informed that Mr. Pauly had invented and was introducing the most economical, the most sanitary, the most fire-proof and the most perfect structural material that had yet been devised by man. The tremendous volume of success which has followed in the wake of Mr. Pauly's personal achievements can scarcely be understood by those who are not in touch with the breadth and scope of the material business of this country at least and having some intelligence of the demand and supply of materials throughout the world.

Today there are tile machines built and furnished by Mr. Pauly's company, the Concrete Stone & Sand Company, of Youngstown, O., regularly producing tile for structural purposes on the Atlantic seaboard, on the Pacific coast and at many of the principal markets in the interior of this country and even beyond the seas the influence of this great invention is reaching to spread the opportunities of safe, sane and economical homes for the children of men such as they have never been able to secure until the perfection of this great invention.

No less than \$1,000,000 of capital is now at work in the manufacture of concrete tile of this type. The buildings which have been constructed of concrete tile can now be counted by the thousand and there is not in any case a single complaint of their quality or a suggestion that they could be improved upon or that a better way to make such material is in the bounds of mechanical possibilities.

As has been claimed in these columns more than once by the merit inherent in the material itself it has won its place in the world of building materials and holds the brightest future of any other for the reason that it is applicable and useful in every type of construction and in every kind of structure that can be designed and in each and every case it is about the best material that could be specified and always from one standpoint or another is more economical than the next best selection.

We are illustrating three recent types of concrete tile work, all of the goods being delivered from the Youngstown, O., plant.

The Modern Homes Company, of Youngstown, is a unique, self-supporting philanthropic institution. It was organized in April of the present year with ample capitalization to carry on its business of building suitable homes to supplant the tenement districts of that busy Ohio manufacturing city. The organization is chargeable to the efforts of J. M. Hansen,



APARTMENT BUILDING IN COURSE OF CONSTRUCTION BY THE MODERN HOMES COMPANY, YOUNGSTOWN, O., OF CONCRETE STRUCTURAL TILE.

who, for years, has been the actuary of the charity organizations of the city and he brought this question of improvement before the Chamber of Commerce and thereby interested the foremost business men of the community. He pointed out the crying need for safe, sanitary and economical homes for working men and others, who were not in a financial position to immediately provide themselves with such homes and in line with his suggestions a number of gentlemen became interested and employed George E. Huggins to investigate the best plant and method upon which to proceed to secure the greatest results with the least money in the direction of building a large number of flats or tenements in every way comfortable, habitable and suitable for the homes of working men. Mr. Huggins made a comprehensive and careful examination of all types of construction of all classes of materials and of all systems which have been devised and employed in the past. Several months devoted to this work with the result that Mr. Huggins reported that the tile and system of construction that has been invented by Mr. Pauly and was then being manufactured at Youngstown, as well as at several other places in the United States, were beyond all question the best for the adoption of the company's activity.

Our illustration shows one of the flat buildings, which contains twelve three-room apartments. The cellar and first story walls of this building are all 8" two cell tile, the second story being of one cell 8" tile. They were also used in the construction of the reinforced concrete floor, which is a part of the Pauly system. The roof is a combination of wood and slate and the apartments are designed to be rented at \$10.00. They are fitted with bath, hot and cold water, and every modern convenience. The Modern Homes Company is constructing two buildings of this kind and forty-four detached two-story four-room houses, all of which are of practically the same type of construction. All of these buildings

are located on a seven-acre tract of land, which is laid out in such a way as to leave two and one-half acres for a park in the center, so as to give each and every one of the tenants all the benefits of beautiful surroundings as well as all of the comforts of modern conveniences at such a cheap rental as stated.

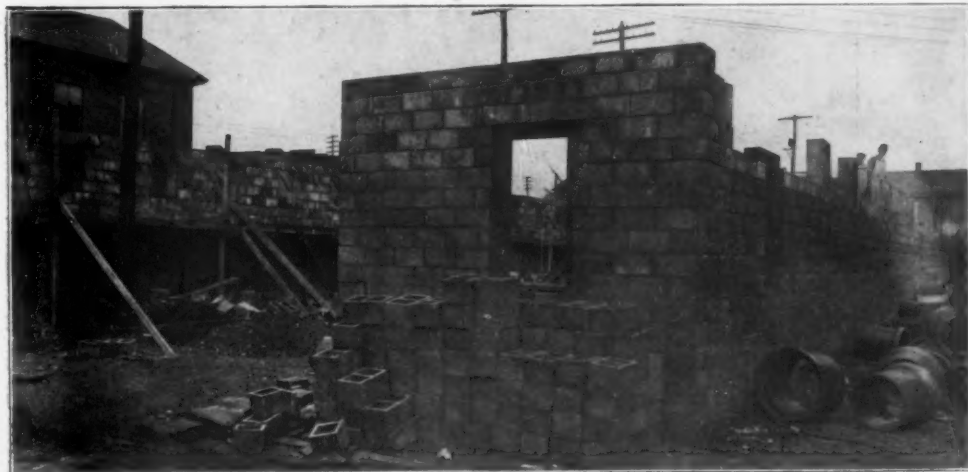
These practical operations of the Modern Homes Company illustrates one of the landmarks in the progress of the age, for many similar philanthropic improvements will be devised for other localities where there is a large and congested laboring population at manufacturing centers. Nowhere, perhaps, have such excellent results been obtained as those now nearing completion in the operations of the Modern Homes Company of Youngstown.

For factory construction, the Pauly tile are a distinct success, as illustrated in the construction of the Stanley works at Niles, O. This is a branch of the hardware specialties concern whose home establishment is located at New Britain, Conn., and they have recently located the western works at Niles, O. As will be seen by our illustration the buildings are all of steel frame, while all of the curtain walls, amounting to about 33,000 square feet, are being constructed of concrete tile. The outside finish of the tile wall is to be composed of stucco, which is sprayed to the tile surface by means of a nozzle. The roof of this building will be of reinforced concrete, consisting of slabs made of concrete poured over triangle mesh wire fabric, and the floor of the great workshop will be of hard concrete pavement. It is a good example of the highest type of modern factory construction being absolutely safe, from fire damage, together with all of the inherent advantages of concrete construction, including the light and strong hollow wall, the impervious roof and durable floor.

The stable of the Youngstown Ice Company, which is 40'x250' in size, two stories high, exhibits the wisdom of one of the leading building supply houses of the country in providing a barn for its fine horses and wagons. The walls of this barn are composed of 10" two cell tile and all of the courses up to 6' high are filled solid with concrete. This is to provide for the constant shock of heavy wagons and the hard usage to which such a building is usually exposed. In such a building, with the loft floor and roof constructed of reinforced girders and hollow tile, in combination, an absolutely fire-proof barn could be made which would amount to practically complete protection from the great fire danger which is usually attendant to such investments.

This is something which will especially appeal to a wide circle of readers of *ROCK PRODUCTS* who have heavy investments of a similar kind in wagons and teams for the delivery of building material. Probably there is no other barn quite as fire-proof and sanitary as this one, which is made possible by the economies which have been introduced into practical construction work by the Pauly tile and system of concrete construction.

These three types of construction have been selected from the work of the oldest plant now in the business of manufacturing concrete tile. Similar exhibits could doubtless be had from all of the other manufacturers in their several localities and as the distribution of the plants for the production of this ma-



STABLE OF YOUNGSTOWN ICE COMPANY, YOUNGSTOWN, O., CONSTRUCTED OF CONCRETE STRUCTURAL TILE.



STEEL SKELETON FRAME OF BUILDING OF THE STANLEY WORKS, NILES, O.

terial is such that it can be had now in nearly every important building market. It is a distinct suggestion to intending builders to consider concrete tile in connection with the investment of their money in these or any other kind of building work.

ORDERED A COMPLETE OUTFIT.

A. A. Low, proprietor of the Horseshoe Forest Preserve, Horseshoe, N. Y., has recently ordered from the Concrete Stone & Sand Company, of Youngstown, O., a complete outfit of tile machines for the manufacture of concrete structural tile of the Pauly type, to be used in the reconstruction of offices, tenement buildings and all other construction on that extensive estate. Recently they were visited by fire, which destroyed the office building, entailing considerable loss. All the future construction of this immense establishment will use Pauly tile exclusively.

WILL ERECT CONCRETE FACTORY.

Moline, Ill., June 20.—Deere & Co. are going to make large additions to their plant the coming season by erecting several concrete buildings. The rock used in this work will be secured from quarries on the property and crushed in a plant recently ordered from the Allis-Chalmers Company. The machinery used will consist of a No. 6 style "K" Gates gyratory breaker, one set of 40"x15" Anaconda crushing rolls, one No. 6 style "B" elevator with 60-foot centers, and one 48"x18" screen. To drive this machinery two Allis-Chalmers induction motors will be used, one 100-h. p. and one 30-h. p.

TO MANUFACTURE CONCRETE PRODUCTS.

Jackson, Tenn., June 10.—T. L. Hilliard and A. B. Pomeroy have engaged in the manufacture of concrete products in this city. They are putting in machinery to concrete shingles.

BUSY IN IOWA.

Leon, Ia., June 19.—The Leon Cement & Brick Company is turning out a large amount of blocks, brick and posts at their present plant. They expect to put up a concrete block building to enable them to work all year.

WILL ERECT HOUSES OF CONCRETE.

Jacksonville, Fla., June 20.—The Duval-Schub Concrete Construction Company has been organized to build concrete houses by the pouring system. Steel forms will be used. The officers of the company are: J. N. Coons, president; Stockton Broome, vice-president; C. S. Cowenhowen, secretary-treasurer. The general offices of the company are at 307 Atlantic National Bank building.

NEW FIRM GETS CONTRACT.

Fox Lake, Wis., June 12.—J. C. Williams and John Roger have opened a concrete block factory here and have secured the contract for furnishing blocks for the new city hall.

IOWA FIRM BUSY.

Muscatine, Iowa, June 21.—One of the busiest concerns here is the Muscatine Concrete Works, owned by A. Kemble and C. M. Bell. Their plant is located at 507 East Second Street. All kinds of concrete products are made at this plant.

WILL MANUFACTURE BLOCKS.

Green Bay, Wis., June 16.—R. S. Vincent, a contractor here, has recently added to his equipment a concrete block machine, which he has placed in one of his sand pits. He is now engaged in making blocks for foundations and other purposes.

The Highlands Cement Products Company, Davenport, Ia., has been incorporated with a capital stock of \$1,000, by C. A. Moses and Tillie Shanon.

CONCRETE IN CHICAGO.

Various Methods Used in Constructing All Kinds of Buildings—Much Cement Used in Foundation Work.

Concrete has played an important part in building operations in Chicago for some time past. There has been no building put up recently in the city where concrete has not been used, either in floors or in foundations. Structures entirely built of concrete, foundations, walls and floors, are confined to field houses in some of the great and beautiful parks, and the huge Montgomery Ward warehouse at Chicago Avenue Bridge, which is the only structure having monolithic concrete walls.

The average mercantile building, five to seven stories in height, is built mostly on the reinforced concrete plan. In almost every case the walls are of brick and the curtain walls also, the latter carried on reinforced concrete lintels and girders; the floors, the long span flat slab reinforced concrete construction. In the reinforcement, almost always, what is called a deformed bar (corrugated or twisted) is used.

One-fifth of the buildings are designed with steel columns and steel girders. One-half of these buildings so designed have combination tile and reinforced concrete floors, the other half the plain reinforced concrete floor. In the column work, the spiral or hoop reinforcement is almost entirely used.

Alexander C. Warren, manager of Hoeffer & Co., cited instances where a series of buildings in La Salle erected by his company were built entirely of concrete, including the walls. They are the elevator buildings of the Chicago Portland Cement Company and the German-American Portland Cement Works, used for storage of bulk cement. Their dimensions are 200'x80' and 60' high. The walls and tunnels of these buildings are heavily reinforced with steel bars.

H. L. Emerson, consulting engineer, concrete, municipal and bridge engineering, has done much concrete construction work in Chicago and the country. He built the first reinforced concrete bridge in the state of Illinois, at Techny, in 1903, designed by the elastic theory of arches. It also bears the distinction of being the first arched bridge of concrete over the Desplaines river. He also built the second concrete walk with spaces underneath, in Hubbard Court, Chicago. The building specifications of the city have always discriminated against concrete construction, it is averred. Mr.

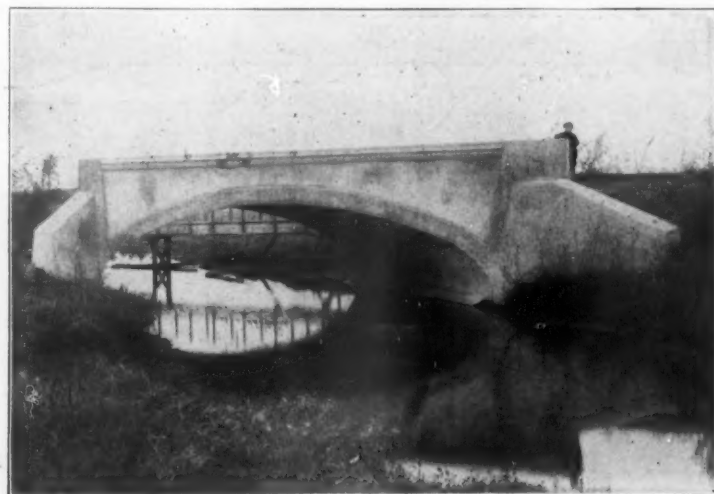
Emerson went to the city engineering department with his plans for the Hubbard Court sidewalk to get a permit. The department first refused to grant one. It was declared "no good." After showing the principle on which it was figured it was O. K'd. The regular city specifications called for steel beam girder construction, with arched concrete between beams, which is very heavy and expensive, making it necessary to use more concrete in combination with steel beams than is necessary in well designed reinforced concrete without the use of steel beams. One of the reasons given at the city engineering department for refusing at first to issue the permit, was the poor inspection in the city by inspectors, and the inclination of contractors to leave out reinforcement.

At first the only promoters of reinforced concrete were manufacturers of patent reinforcing bars with the exception of a very few engineers. At that time an acrimonious argument was urged among engineers regarding the destruction of reinforcement, caused by rusting or oxidizing of the bars, after being placed—a point that is now very seldom raised. The city specifications now provide for a standard, at which reinforced floors and walks may be built.

In the southern section of the city Mr. Emerson recently erected a structure 200'x100', to be used for factory purposes. It is sustained on reinforced concrete pilasters with pressed waterproof concrete blocks. The curtain walls constructed of these blocks are 8"x8"x24", made on a machine under pressure of 80 tons by the Anhyrous Pressed Stone Company. These blocks are cured in steam, and can be shipped in 30 hours after making. They have shown under test a pressure of 1,800 pounds to the square inch. The reinforcement in this one story high structure was plain round steel bars and the floor of concrete. He also put up a warehouse of similar construction in the Calumet region. He built several stock houses at La Salle for the Chicago Portland Cement Company. Two of them, 208'x70', each, used for the storage of cement in bulk. One is 38' and the other 48' in height. These are monolithic concrete buildings. Under each building there are two concrete arched tunnels, which contain the conveying machinery. These tunnels sustain a pressure of 40,000 pounds to the square foot.

W. E. Ehrman, engineer and general superintendent of the Pleas Concrete Construction Company, was busy on plans of four large buildings now under construction. The company has just completed the Thomas Flyer automobile building at Twenty-third Street and Michigan Avenue. It is four stories high and everything in it but the curtain walls are of concrete. At Kensington, Ill., the company recently finished the five-story structure for the Sherwin-Williams Company. The walls are brick bearing and the interior concrete.

Condron & Sinks, consulting structural engineers, have introduced lately a design of reinforced concrete construction which is entirely new and different from other types of building construction so far used in this country. They are doing much reinforced concrete construction work in Chicago. Among the new buildings erected by them the unique reinforced construction of the Studebaker automobile building at Michigan Avenue and Twenty-first Street received much favorable comment from architects.



FIRST REINFORCED CONCRETE BRIDGE IN STATE OF ILLINOIS; CHICAGO AA PORTLAND CEMENT USED.

Contractors and engineers use many systems of reinforced concrete construction. These systems differ principally in the reinforcement. In some cases steel bars are used, in many cases plain and twisted steel bars and in others triangle wire mesh made by the American Steel & Wire Company, and wire lath with metal mesh, the latter being often used alone. In the mixture of cement, sand and gravel for the aggregate, crushed rock is as often used, perhaps, as gravel. It was found that the concrete mixers recognized as standard by Rock Products were largely used by contractors in this work in Chicago.

Many hundred thousands of barrels of cement are used annually in the building operations of this city, which can clearly be seen to be no exaggeration when known that the foundations of one structure—by no means the largest in course of erection this year—the new Sherman House—has used approximately 10,000 barrels of Universal Portland cement. It must also be borne in mind that in the last few years, modern Chicago methods of constructing foundations to bed rock have been adopted, ranging in depth from 100' to 120' below the level of the street, in place of the old pile and floating foundations, which has increased concrete construction work many fold in this short period. Furthermore, all large buildings now put up in which the floors are intended to carry heavy loads are of reinforced concrete construction. So, notwithstanding the claims that reinforced concrete construction work has been handicapped by discriminating city building specifications, this work has swept all obstacles aside and is today at high tide of activity.

CONCRETE CULVERT PLANT MOVED.

Belle Plaine, Iowa, June 14.—The American Concrete Company has moved its concrete culvert plant from Ft. Smith, Ark. R. J. Span is the superintendent. The plant is now engaged in making culvert concrete for the C. & N. W. railway, on whose line the plant is located.

BELIEVES IN HIS PRODUCTS.

Murdo, S. D., June 21.—C. M. McDonald has commenced operations for the manufacture of concrete blocks and bricks. He demonstrated the adaptability of this material by erecting a building for himself.

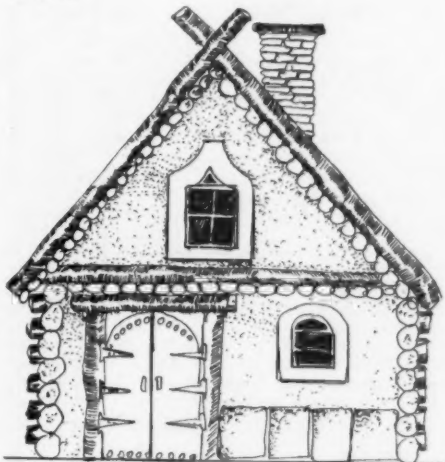


Fig 1



Fig 2.

Fig 3

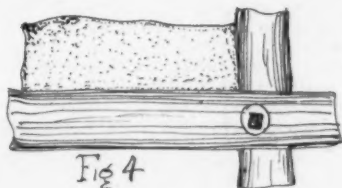


Fig 4

CONCRETE LOG HOUSES.

Since the application of cement to so many lines of structural work there have been numerous designs created in connection with log houses. The development of the cement industry has enabled architects to form designs of modern descriptions of log residences for the country service, the beaches, the city estate or wherever required.

Some of the designs of logs in combination with concrete effects are exceedingly attractive in appearance. Other styles are plain. Some are made up with real rocks or pebbles for the rubble surfaces, while other types are executed with the imitation of rock and pebbles with cement material. Then there are cottages designed with the rubble surfaces set off with broken bottle green glass. Some good effects have been secured with hardwood set in blocks, angles, sections, curves and the like in the cement walls of the log frame cabins. There are other patterns possible when wrought iron or steel sections, elbows, cornices, parts of frames, turns, etc., are utilized in conjunction with the rubble work, cement and log work. Furthermore, models of attractive combination log and cement houses are made by introducing novelties in window sash, frames of heavy doors, metal doors, sheet iron or tile smoke stacks, novel-shaped windows, projecting ends of logs at the corners and kindred work.

Figure 1 illustrates one form of the log house when erected along the lines suggested. In this example the house is built with log sides and the front and back with cement covering on the log base. The sides can be filled in with the cement, too, if desired, thereby showing the log work only at the edges. Or, instead of having a smooth frontal, made with the cement packed in between the logs, the cement packing may be used for filling purposes only. This filling need not extend so deeply as to entirely cover the lines of the logs. Therefore the log surfaces will show, resulting in a novel exterior for the building. The detail of putting up the logs is shown in the cuts in order.

Figure 2 shows the manner of uniting the edges of the logs when it is desired to have the ends square.

The ends of the logs are simply chipped down to the square form required, and then the logs of one series are cut out so as to admit of the jointing of the logs of the other angle as shown in the view. After the jointing work is completed the mixed cement is packed in between the logs and is permitted to set there, resulting in a very firm and tight wall when the work is correctly done. The cement, sand and water should be properly mixed and put into order for use. The cement, when applied in too wet condition, makes it impossible for the workman to properly pack the stuff, as it runs from him. Again the mixture may be too dry, and packing will be difficult. By getting the mixture the right condition, the cement can be placed securely in position and allowed to dry out. Such a concrete wall will last indefinitely.

Figure 3 shows the mode of effecting the corner connection when the logs of one series are to be round. The logs are cut out oval shaped at the joints and the logs of the opposite series are placed in as shown. Then follows the concreting as before.

Sometimes a joint is made with a bolt passing through the two logs at the terminal, as in Figure 4.

Figure 5 is an illustration of a building erected with the logs planed and the ends squared. This building is intended for service in parks, on large estates for the care-tender, for garage purposes, etc. The wood should be of a quality capable of taking a finish. Polished hardwood door frames, window frames and frame-work for the entire structure gives the building of this nature an attractive appearance when built up in unison with the cement walls and fillings.

There are models of log structures created with concrete imitation logs as in figure 6. It is possible for the designer of cement goods to make imitation concrete logs so well that you can image that the artificial log is the genuine article. Some of the concrete workmen prefer to erect the log structure with logs made from moulded concrete. These logs are cast with the ends properly recessed for the jointing of the logs of the opposite angle of the wall. The concrete log is often cast with the filling space ready made in such way that the material forming that space readily interlocks with the material of the adjoining log.

WILL MANUFACTURE CONCRETE PRODUCTS.

Fulton, Ill., June 21.—John Bly and Edward Sullivan have started a concrete block and brick plant here. They have leased a building which they will use for a shop.

Morgan & Dillon are the architects for the Third National Bank Building at Atlanta, Ga. Purdy & Henderson are the engineers on the work. The foundations of the structure are to be of concrete.

WILL MAKE CONCRETE TILE.

Sterling, Ill., June 18.—Joseph Hodges has purchased a cement tile machine and is now making cement drain tile of from 5 inches to 12 inches in diameter.

READY TO COMMENCE OPERATIONS.

Superior, Wis., June 16.—Whitney Brothers, who have recently completed a concrete brick plant, are about ready to start manufacturing commercial brick. Joseph Keener is superintendent of the plant. This plant is modeled after the Universal Brick Company's plant at Utica, Ill.

BRICK PLANT AT WICHITA.

Wichita, Kan., June 20.—The Wichita Cement Brick and Supply Company, with a capital stock of \$50,000, has been incorporated and will engage in the manufacture of cement brick, in this city. The company now has in course of erection a building 100 feet by 150 feet, two stories high, in which the brick they manufacture will be used.

The equipment for the plant is to be furnished by the Buckeye Engine and Foundry Company, of Joliet, Ill.

Sand will be pumped from the Arkansas river to be used in the manufacturing process. The company owns 2½ acres of ground, conveniently situated between two lines of railroads, so that ample shipping facilities are assured. The officers of the company are: John Tracy, president and general manager; Robert Smith, Kingman, Kan., vice-president; J. C. Pierson, Wichita, treasurer, and Roy C. Miller, Wichita, secretary.

MYERS CONCRETE COMPANY FORMED.

Wheeling, W. Va., June 18.—The Myers Concrete Company has been organized at this place, and the company has already secured a number of contracts for laying concrete sidewalks in the town of Edgewood. M. L. Myers has been elected manager of the company.

The Linesville Concrete Construction Company, of Linesville, Pa., has been incorporated with a capital stock of \$10,000.

The Armor Concrete Construction Company, of Boston, Mass., has been incorporated with capital stock of \$30,000, by H. J. Osborne, Dorchester, president, and E. W. Osborne, Somerville, treasurer.

The Standard Sanitary Flooring Company, of Wilmington, Del., has been incorporated with capital stock of \$25,000. They will manufacture and deal in concrete, tiling and fancy brickwork.

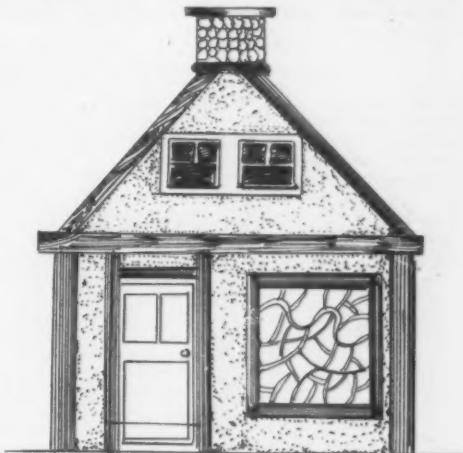


Fig 5

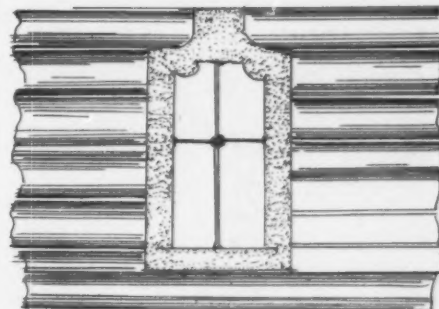


Fig 6.

WHITE SOX BASE BALL PARK.

(Continued from page 3.)

which run through the main deck and also help to carry certain reinforced concrete girders of the same. They are about 33'1" apart and are enclosed with reinforced concrete under the main deck.

The main deck or lower deck can be reached either in front or rear after passing the turnstiles at the main entrance through the great foyer. Four great inclines built of reinforced concrete girders and slabs take the place of stairs up to the rear of the main deck to a wide promenade running all around the building. The inclines are built on a basis of one-half inch to one foot, hardly noticeable while one is walking over same. Wide concrete stairs of short runs feed the main deck from the front under the grandstand through turnstiles to the wide promenade running along the entire front of the building between the boxes. There are numerous exits from the main deck to the field.

The upper deck can be reached by getting on the main deck first and from there to a wide promenade by several wide concrete stairs and inclines, connecting the different aisles. The upper deck consists mostly of structural steel, supporting banks of reinforced concrete which are 18" high and 3'0" wide throughout, including the press boxes. The right and left pavilions are built of reinforced concrete entirely, with the exception of the steel columns which run through the deck and carry the roof trusses and some of the supporting reinforced concrete girders. The seats in the grandstand have regular opera chairs, however, with wood seat 18" wide, 2'10" from back to back, the boxes having individual chairs. The seats in the pavilions are



SOX BASE BALL PARK STAND, BUILT OF REINFORCED CONCRETE.

formed by a continuous board 2" thick and 10" wide, bolted to 5" I beams, which are secured in the concrete.

Besides having the longest foul lines of any ball park in the country, the new White Sox Base Ball Park also has the greatest seating capacity and the finest sight lines. Its areas are as follows:

Grandstand, Main Deck	78,000 Sq. Ft.
Upper Deck	54,000 Sq. Ft.
Pavilions	26,000 Sq. Ft.
Bleachers	23,000 Sq. Ft.

The actual seating capacity is as follows:

Grandstand:	
Reserved seats, Main Deck	9,500
Upper Deck	2,500
	12,000

Boxes, Main Deck	2,500
Upper Deck	2,000
	4,500

Total	16,500
Pavilions	8,000
Bleachers	7,000

Grand total 31,500

The height of the grandstand is 28'6" to top of main deck, 62'0" to top of upper deck, and 74'0" to top of roof. The exterior design of the building is very simple, however, unique and original, and will be, when everything is carried out to the ideas of the architects, an imposing structure, a great monument to the greatest of all games, the National game, Base Ball.

The Benedict Rochester Bissell Company, New York City, has been incorporated with a capital of \$100,000, to manufacture and deal in concrete and natural stone, building materials, etc., by James G. Benedict, Troy; Montgomery H. Rochester, Thomas T. Bissell, Albany.

"LONGITUDINAL REINFORCEMENT IN CONCRETE COLUMNS."

By Sanford E. Thompson, M. Am. Soc. C. E.

Of the three common methods of strengthening concrete columns so as to reduce the size below that which would be required by an ordinary mixture of plain concrete—namely a rich mixture, longitudinal reinforcement, and hooping—each has its advantages and limitations.

By increasing the percentage of cement there is an increase in the strength of the concrete per square inch of section. By inserting vertical steel, this receives a share of the compression and thus permits heavier loading. By hooping or banding, the ultimate strength is increased and the column is rendered more ductile.

The writer has presented on previous occasions the limitations of hooping, which although very effective in increasing the ultimate strength of the column, does not greatly advance the point of the first beginning of the failure, because the hoops do not get into action until the concrete begins to crush and expand laterally so as to put tension on the hoops. Columns with longitudinal reinforcement imbedded in them to reduce their size are apt to be more expensive than plain concrete columns of equal strength, but the occasional criticisms that vertical bars do not add to the strength of the column are absolutely unfounded by either theory or test. On the contrary, both theory and experiments show that the longitudinal reinforcement, properly placed does actually increase the strength of the column.

The principle is very simple. When a load is placed on a column of any material whatever, it is shortened by a small amount, but this shortening within working limits is substantially in proportion to the load placed upon it; that is, with a column of any homogeneous material if the working load is doubled, the amount of shortening is also doubled. Now, if vertical steel bars are imbedded in concrete, they also must shorten with the concrete when the load is applied, and therefore they relieve the concrete of a portion of its load. It is physically impossible to prevent such vertical steel taking a part of the load unless the steel slips or buckles, and since the power of resistance of the steel bars to shortening is greater than that of the concrete, the load necessary to shorten them is proportionately greater than would be required for concrete of the same area. The action of structural steel reinforcement is similar, provided the bond between the steel and the concrete is



CONCRETE SCHOOL HOUSE, JACKSON TOWNSHIP, LINN COUNTY, IOWA.

2,032 pounds per square inch; vertically reinforced columns, 2,438 pounds per square inch.

These cover all the important series of column tests made in the United States to date, and not a single average of similar specimens but shows a decisive increase in strength of columns reinforced with vertical steel bars over those unreinforced. Furthermore, although this is not taken up in this discussion, it may be shown that tests bear out conclusively the conservatism of computing the value of the vertical steel bars by the ordinary formulas based on the ratios of the moduli of elasticity of steel and concrete.

A CONCRETE SCHOOLHOUSE.

The residents of Jackson township, Linn county, Iowa, have recently built a concrete schoolhouse. The building is 24 feet by 30 feet with an 8-foot basement and 11 feet between the floor and ceiling of the schoolroom. Concrete was used throughout except in the gables. A metal furring block was put in the walls to hold the lath on the inside so that there is an air space between the plaster and outer wall. It is heated by a furnace placed in the basement and there is a cloak room for the pupils. The cost of this building, including the seats and furnace, was \$1,600, complete. The schoolroom will seat forty pupils. This building replaces the stone building immediately behind it, which has served the township for fifty-two years.

STOCKTON ARTIFICIAL STONE CO.

Stockton, Cal., June 17.—The Stockton Artificial Stone Company is one of the progressive concerns of the industry. In a recent issue of their local paper, they had an advertisement in the form of a write-up descriptive of concrete products. A detailed description of the various lines made in concrete was given and the advantages of using this material over anything else for building purposes. The firm is composed of L. J. Abel and E. E. Gordon, and the plant is located at Main and Grant Streets.

NEW FIRM IN TOPEKA.

Topeka, Kan., June 20.—The Topeka Stone & Material Company has purchased the plant of the Topeka Cement Stone Company, 408 East First Street. The new firm has installed a concrete mixer as well as concrete block machinery.

WILL ERECT PLANT.

Chillicothe, Mo., June 18.—S. A. Stone has purchased property on the river bank here and proposes to erect a concrete product plant. Sand used in the manufacturing will be taken from the river.

NEW INCORPORATIONS.

The Lehi Concrete Block Company, of Salt Lake City, Utah, has been incorporated with a capital stock of \$5,000. The officers of the company are: G. W. Nesbitt, president; B. C. Grainger, vice-president; L. U. Barton, secretary; and J. A. Bringham, treasurer.

The Columbia Post & Manufacturing Company, of Mobile, Ala., has been incorporated with capital stock of \$5,000. It will manufacture concrete and other material to be used in marking lines for railroad rights of way, etc. Raymond Randolph, of Mobile, is the principal stockholder.

The Twentieth Century Portable Paving Machine Company, of Phoenix, Ariz., has been incorporated with capital stock of \$15,000.

The Knightstown Concrete Company, of Knightstown, Ind., has been incorporated with capital stock of \$6,000, to manufacture concrete building materials. The directors are: Harry Watts, W. S. Garretson and E. B. Byrket.

perfect. This bond is more difficult to obtain with vertical structural steel than with vertical bars, and tests with latticed angle bar reinforcement have indicated a less effective increase of strength with this structural steel than with vertical bars.

Considering then only columns with bar reinforcement, the question is whether these vertical steel bars do slip or buckle. Evidently they cannot slip if the ends are securely held by the concrete, and this is always the case if they are properly butted or lapped for a sufficient length. As to buckling, tests have proved conclusively that vertical bars, such as are used in columns, when imbedded in concrete will not buckle until the elastic limit of the steel is reached, and beyond this point of course no steel or other material is expected to do any service.

To present evidence of this statement, I refer to some of the average results obtained from various tests. The results are given in round numbers simply to show that the steel does increase the strength of the column. The values of the tests at the Watertown Arsenal, for instance, show how closely the increase in strength corresponds to that which would be figured by the ordinary formula, and especially how far the computed values are on the safe side. Similar computations might be made from other series, but for the purposes of this paper they are unnecessary.

In Taylor & Thompson's "Concrete, Plain and Reinforced," Second Edition, 1909, p. 493, you will find the results of tests at the Watertown Arsenal.

One of the first series of tests on reinforced concrete columns was made at the Massachusetts Institute of Technology, and showed that the strength of the reinforced columns was much greater than had been computed.

Although individual tests made at the University of Illinois may be cited where the strength of a plain column is greater than the strength of a similar vertically reinforced column, an average of the tests taken from page 14 of Bulletin No. 10 as given by Prof. Talbot shows: Plain columns, 1,550 pounds per square inch; vertically reinforced columns, 1,750 pounds per square inch.

Tests at Minneapolis were made on small sized columns, and the results therefore are not of so great value as some of the other tests. However, comparison of plain columns with those vertically reinforced which are not cut up by horizontal reinforcement is very marked, the average being: Plain columns, 2,020 pounds per square inch; vertically reinforced columns, 2,300 pounds per square inch.

Averaging the results of tests at the University of Wisconsin of columns with no reinforcement and those of the same kind of concrete reinforced with vertical bars and no spiral reinforcement, gives: Plain columns,

SECURITY PORTLAND CEMENT

(Annual Capacity 700,000 Bbls.)

**BERKELEY LUMP LIME**

(Carbonate of Lime 98.28%)

For Building, Chemical and Agricultural Purposes.

BERKELEY RUN OF KILN LIME

(For Agricultural Purposes)

BERKELEY GROUND LIME

(Fresh Burned Lime Uniformly Ground)

BERKELEY GROUND LIMESTONE

(For Manufacturing and Agricultural Purposes)

FLUXING STONE FOR BLAST AND OPEN HEARTH FURNACES

(Silica Less than 1 Per Cent)

CRUSHED STONE

(All Sizes)

For Railroad Ballast, Road Work, Concrete and General Building Work.

SECURITY CEMENT & LIME CO.

EQUITABLE BUILDING

BALTIMORE

**Soundness**

—extreme fineness—high tensile strength—good color—regular setting qualities—uniformity—quick shipments—fair treatment—all these are considerations which should influence you to use Universal Portland Cement.

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Annual Output 8,000,000 Barrels

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PORTLAND CEMENT

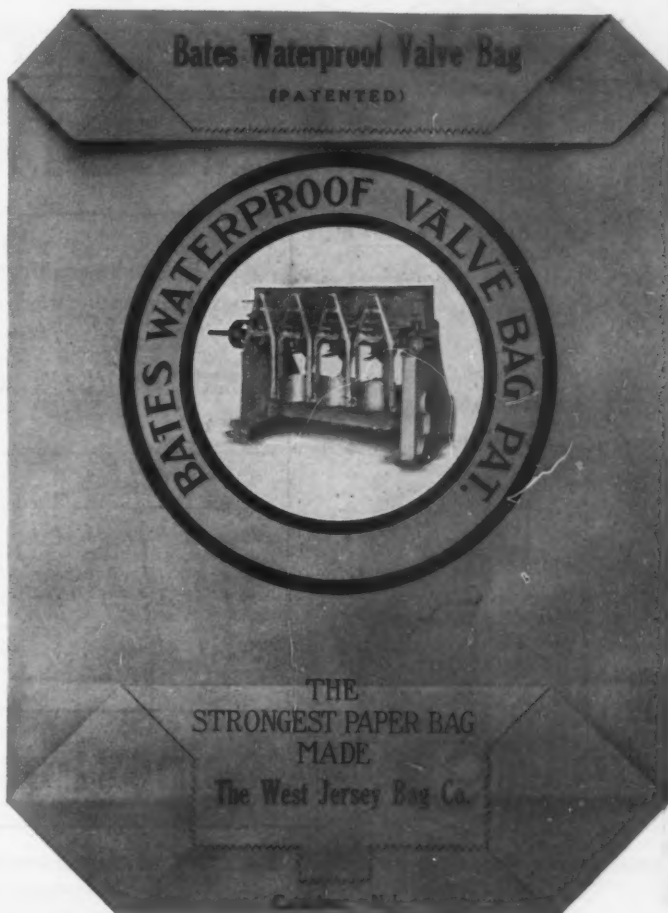
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Highest Tensile Strength
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UTICA HYDRAULIC CEMENT

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FOR UNDERWATER ENGINEERING WORK

BEST

For BRICK and STONE Mortar

Its superiority has been demonstrated from one end of this country to the other.

NO OTHER CEMENT CAN COMPARE WITH IT.

Utica is the Natural Cement. Its chemical combination **never** changes.
It is Plastic. It is strong. It is Durable. It is fireproof. It is Uniform,
It is Cheap. It is Well-known.

It has a record showing over Seventy years of **unqualified** success.

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UTICA HYDRAULIC CEMENT CO., UTICA, ILL.



MILL:
Kosmosdale,
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Kosmos Portland Cement Co.

RELIABILITY

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WAR DEPARTMENT
ENGINEER OFFICE, UNITED STATES ARMY.

Nashville, Tenn., February 20, 1909.

KOSMOS PORTLAND CEMENT COMPANY,
Louisville, Ky.

Dear Sirs:—Replying to yours of the 12th instant, I beg to advise you that our records show that 22,250 barrels of Kosmos cement were received at Hales Bar, Tennessee River, for the lock under construction at that point, between June 23 and September 25, 1908. All of this material was tested and all of it accepted under the requirements of the Engineer Department specifications.

Very respectfully,
WM. W. HARTS,
Major, Corps of Engineers

A Destructive Fire Prevented the Completion of the 100,000 Barrel Contract. The Rebuilt Mill is Fire-Proof.

It is universally recognized that no tests are more exacting than those of the War Department. A record of uniform acceptance, such as the above, is the best assurance to the purchaser of the unvarying quality of KOSMOS cement. It is a FACT—more convincing than any amount of TALK.

ASK FOR QUOTATIONS

Kosmos Portland Cement Co.

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SALES OFFICE:
Paul Jones Building,
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Tell 'em you saw it in ROCK PRODUCTS

Security" Bag Binder

Substitute for wire and rope—prevents bags from getting lost, strayed or stolen. Locks automatically. Eliminates freight claims. Costs less than wire or rope. Saves 80% time of wiring and tying.

"The Easiest Way."



"A Trouble Destroyer"

Eliminates all Bag Troubles—Simple—Sane—Secure

Further Information Upon Request

The Shipping Appliance Co., 134 Monroe St., Chicago, Ill.

Superior Endures

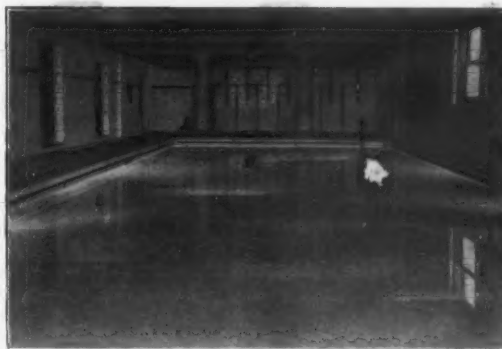
Costly structures are being built of high magnesia cements, when Superior Portland Cement, which contains only a fraction of one per cent magnesia, might just as well have been used. The day of reckoning is bound to come. Why take a chance? Superior at double the price of such cements would be cheap. Still, it costs no more than the kind that is bound to crumble. Superior Endures. Booklet "C 7" tells the story of the reason. Address,

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CLINTON, N. Y.

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Be sure you get the genuine with the "Little Yellow Side-Label" on each package.

Let us tell you about Side-Walk Blanks

Washed-Steam Dried and Screened

Ottawa White Sand

Unexcelled for

Facing Concrete Blocks
Ornamental Concrete Stone
White Plaster
Roofing
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Prices, Freight Rates and Samples on Application

You can order less than a car load, in fact Shipments as small as five 175 lb. bags can be delivered economically. Send an order for five bags and try facing your blocks with white sand. It will pay big.

The Only Standard Sand

Ottawa Silica Co.

Ottawa, Illinois

LARGEST SHIPPERS OF WHITE SAND IN THE UNITED STATES

Tell 'em you saw it in ROCK PRODUCTS

Your Bag Repairing Reduced 90 %

Why bother sewing on patches, and then have stitches tear out, when by using

Little's Sac Patching Sement

You secure a permanent patch, better and more easily done.

It is applied with a brush. Time of mending and money saved.
Isn't that economy? Write for further particulars.

The C. H. Little Company, DETROIT, MICHIGAN

Contractors and Cement Manufacturers Need



RICHARDSON Automatic Scales

Because they will earn excellent dividends on important concrete construction work by accurately measuring the cement, sand stone and water in correct proportions by weight. Because in a cement plant they will give absolutely accurate proportions of the raw materials before mixing, a positive check on all coal received, the accurate weight of all coal dust delivered to kilns the exact amount of clinker produced, the correct proportions of clinker and gypsum, a positive record of finished cement delivered to stock bins, and, finally, the dustless, accurate and rapid weighing and packing of the finished product into bags.

Richardson Automatic Scales are the World's standard for Automatic Weighing—more of them are in this country than all others combined. Shall we send the catalog?

RICHARDSON SCALE COMPANY

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This Box Flies Like a Comet?

No. It Needs Wheels.
Perhaps you have them.



The owner of a set of wagon wheels does not always realize how little additional money is needed to put a good dump box on them. However, do not err by thinking that it is immaterial WHAT dump box you buy. Look first to see whether the dump box has steel doors—the kind that can not break, shrink, warp, or wear. Look next to see whether the doors overlap when closed—the kind that cannot leak at the joint. Look then to see whether the doors are closed by chains that wrap around spiral drums at the ends of a steel shaft—the kind that always closes tight, never wears, never sags, never breaks. When you see these essentials you will be looking at a Troy Dump Box. It fits any teaming gear. Send for Bulletin P giving details.

THE TROY WAGON WORKS CO.

101 East Race Street

TROY, OHIO

Tell 'em you saw it in ROCK PRODUCTS

QUARRIES

PRELIMINARY REDUCTION

By the Edison Rolls Proves a Success in the Plant of the United States Crushed Stone Company at McCook, Ill.

Crushed rock operators who supply the Chicago market have vied with one another to see who could produce the greatest amount of material. For the immense demand that has been required in the past two years, it has been necessary to greatly increase the capacity of each plant in this vicinity in order to be in the game.

One of the largest and most successful concerns in supplying this market is the United States Crushed Stone Company, 184 La Salle Street, Chicago. Its principal quarry is located at McCook, Ill., fifteen miles west of the city, on the A., T. & S. F., Indiana Harbor Belt, B. & O. and the C. T. railroads. Here they have one of the most modern and up-to-date plants in this vicinity. A feature of it is the machinery required for preliminary reduction.

The officers of the company are men who are not afraid to try out any new features to increase the efficiency of their plant, and one will find here a greater number of new ideas than can be found in any other plant in the country.

In the first place, they were one of the first to use the well drill in the quarry. They have found that by the use of this machinery the quarrying cost has been reduced to a large extent. At the present time, they are working several well drills in this quarry. Ten days ago they shot a blast which probably moved more stone than has ever been shot at one time before. Forty holes were sunk forty-five feet deep and approximately 80,000 yards of stone were moved at one operation.

In the quarry to handle this stone they have one Bucyrus and one Atlantic steam shovel, and have just put into operation a second 110-ton Bucyrus shovel, with a dipper capacity of $3\frac{1}{2}$ cubic yards. The steam shovels load the stone into cars, which were especially designed for this quarry. The cars are standard gauge flat cars, which carry a steel skip, with a capacity of ten cubic yards. These skips are open on one side to facilitate quick dumping. This equipment was built by the Kilbourne & Jacobs Manufacturing Company, Columbus, Ohio.

Three 14x22 saddle tank locomotives are used in the bottom of the quarry for switching these

cars in trains of six each to the foot of the incline leading to the Edison roll building, and are hoisted by means of a 300 H. P. Lidgerwood electric hoist into the roll house building. The skips are dumped into the upper hopper of the roll by means of an electric hoist, which slides the skip off from the car platform on to the skip table, and tilts the skip until the contents are discharged into the rolls; the same hoist returning the skip to the car platform.

The Edison rolls rest on two large girders, supported by a substantial concrete foundation, on which girders the housings carrying the rolls proper are mounted, and are so arranged that the housings can be moved along the girders, in order to regulate the size of the crushed product.

The rolls consist of shafts, on which is pressed and keyed a steel mandrel, hexagonal in shape, to which are keyed and bolted six chilled iron slugger plates to form a circle. These slugger plates are cast with large knobs, which protrude for the purpose of breaking the rock as it is fed to the rolls. Each roll weighs approximately 50 tons, is 7 feet long and 6 feet in diameter. They are driven independently by General Electric motors of 250 and 200 H. P. respectively, and revolve at the rate of 170 revolutions per minute.

These giant rolls, which are the invention of the famous Thomas A. Edison, are indeed one of the greatest inventions of the age, particularly to the crushing industry. They are manufactured by the Edison Crushing Roll Company, at Stewartsville, N. J. At this plant, they were put into operation in February of this year, and to say that they are satisfactory is unnecessary, for the company is more than pleased with the work which they have done. There has been no repair account thus far, and the highest efficiency has been obtained for preliminary reduction.

The principle on which the crushing is done is by impact and speed, and there is not in any way a crushing action. At the high speed at which these rolls revolve, the stone strikes the sluggers and is hurled with such impact against the opposite roll and back again that it is easily shattered. Examination of the slugger plates show that there is very little wear on them up to this time, and no plates have had to be renewed.

In a recent test of the Edison rolls at another plant 42 cubic yards of rock were dumped into the hopper and crushed in 45 seconds, which is at the rate of one ton per second, or 3,600 tons per hour. It is possible to crush any size stone in these rolls that can be picked up by the steam shovel, up to and including single pieces weighing as much as 17 tons, requiring less than half a minute to reduce these large rocks to sizes of 5" and under.

It is difficult to estimate the capacity of a set of these rolls, and it is almost impossible to keep them fed up to capacity. Even with the present arrangement this company intends to install another runway, so that twice the amount of stone can be delivered to the rolls as is delivered now.

By use of these machines all hand work at the

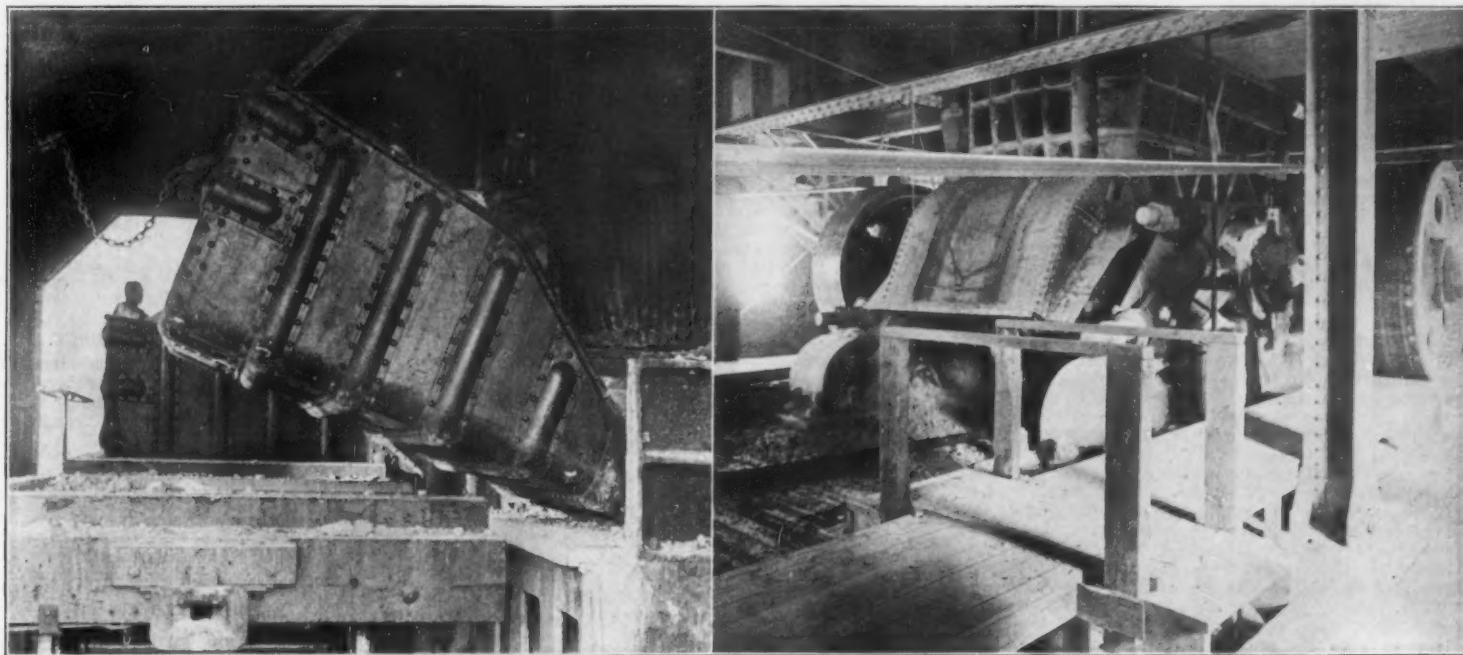
quarry, such as sledging, plugging, hole drilling and dobe blasting, is entirely done away with. In this way nearly all the work is done by machinery, and operations are carried on in all kinds of weather, which is utterly impossible in a quarry where so much drilling has to be done by hand, or where a large force of men is required.

One of the remarkable features in this quarry is the few men that are required in the work in comparison to the amount of material that is produced daily. The power required to operate the Edison rolls is comparatively small, for after the rolls are started, and the maximum velocity is obtained, it requires but little power to keep them going; in fact, when the power is shut off at the close of the day, the rolls continue to run, by reason of kinetic energy, from 8 to 10 minutes.

After the stone passes through the rolls, it drops into a lower hopper, which has a capacity of 40 cubic yards, and from there loaded into 15-yard cars, hoisted and discharged into a 40-yard bin, which is located at the top of the steel structure, 135 feet in the air. This method of handling rock is the same that is used at various blast furnaces in charging their cupolas; the skip cars being of the regular blast furnace design. The hoist which handles these cars is of 300 H. P. capacity, and was built by the Lidgerwood Manufacturing Company, and operates at a speed to enable the skip car to discharge into the tower bin at the rate of one car per minute. The rock from this bin is then distributed to two revolving screens 7 feet in diameter and 20 feet long, which allow all stone crushed to 3" and under to pass through, and which rejects all stone over 3". The undersized stone is carried directly by means of a belt conveyor to Power & Mining Machinery Company's 48"x24' revolving screen, and is at once distributed to the commercial bins. The rejections are discharged half to the No. 8 Gates crusher and half to two No. 6 McCully crushers. The stone is there reduced and elevated to screens and sized for commercial purposes.

In addition to this equipment, there are also two No. 5 and two No. 4 McCully crushers used for further reduction, also a set of Power & Mining Machinery Company's superior crushing rolls, which have a capacity of about four of the ordinary type of No. 4 gyratory crushers. The No. 8 crusher is fed by a pan conveyor, and is so adjusted that the stone is delivered with such regularity that the hopper of this crusher is always filled, and the stone distributed around the head. The principal thing noted by the Rock Products man on his visit was the size of the stone delivered to this crusher. There are few that are more than 5" in diameter. Ordinarily one would see two men distributing the stone in this crusher to secure a uniform feed, and to prevent any choking, which so often occurs, but there is not even an attendant at this crusher, and yet a uniform delivery was made.

In the event the Edison rolls are fed with rock beyond the capacity of the other crushing equip-



SKIP DISCHARGING LOAD INTO ROLL HOPPER.

VIEW IN THE ROLL HOUSE

UNITED STATES CRUSHED STONE COMPANY, MCCOOK, ILL.

ment, the company has provided a large storage bin to receive the rejections from the 7-foot screens. The capacity of this bin is 1,000 cubic yards, and it is so arranged that the rock can be taken away from the bottom discharge gate on to a pan conveyor to an elevator, discharging into the No. 8 crusher. This enables the company to operate one-half of their plant during the night, and re-crush this accumulation, requiring but an electrician and two men to operate the plant.

The company has provided machinery for putting their product in storage piles, and have adequate yards and loading facilities for handling the product in cars. They are in a position to make immediate deliveries of almost any quantity of any size of crushed stone on short notice.

The entire plant, including drills, machine shop, pumps for fire protection, is operated by electric power. The entire plant is lubricated by a gravity system, having a distributing tank at the top of the mill, the oil being piped to all bearings throughout the plant, and drained into a large filter tank on the ground, where the oil is cleaned and returned by a centrifugal pump to the original distributing tank at the top, thereby assuring perfect lubrication throughout the plant at a minimum cost.

Electric power is supplied by the Sanitary District of Chicago; this company is the second largest user of power supplied; the United States Steel Corporation being the only larger user of this power; the total load when in full operation being 2,400 K. W. The company has installed a modern up-to-date switch board, from which point the power



SKIPWAY AND CARS CONVEYING STONE FROM ROLL HOUSE TO THE CRUSHER HOUSE.
UNITED STATES CRUSHED STONE COMPANY, McCook, ILL.

is distributed for each operation, and graphic recording meters installed, to show quantity of power that is used in each department for each operation.

Motors ranging from 3 to 300 H. P. are used throughout the plant, all of which were furnished by the General Electric Company.

The plant is of steel construction, designed and erected by the Kenwood Bridge Company, enclosed with corrugated steel siding, painted throughout with Carb Oxide Elastic Metal Preserver, under a five year guarantee. This paint is manufactured by the Blocki-Brennan Refining Company. The Stockdale, Canterbury Company, 153 La Salle Street, Chicago, Ill., is the selling agent. The pigment is a carbon secured from a lignite coal, and the vehicle is pure boiled linseed oil. The United States Crushed Stone Company are enthusiastic over the performance of this product.

The company are shipping an average of 150 cars of crushed stone per day, and while their market is largely in the neighborhood of Chicago, they are not confined to this one territory. They are furnishing stone for various uses throughout Illinois, Iowa, Indiana and Michigan, and during 1909 furnished crushed stone for the rehabilitation work

of the Chicago Railways Company, and have secured the Chicago Railways Company's contract for 1910.

This company last year located yards throughout the city, and are now in a position to make wagon deliveries to any point within the city limits.

Plans are now under way for a washing plant and it is their intention to wash the rock which is screened after passing the rolls.

FRANCE COMPANY ADDS EQUIPMENT.

Holland, Ohio, June 20.—The France Company has recently placed an order with Allis-Chalmers Company for a No. 9 style "K" Gates gyratory breaker.

PURCHASE A CRUSHER.

Remsen, N. Y., June 12.—The town board recently passed a resolution authorizing the town superintendent, Owen Thomas, to purchase a stone crusher and traction engine and enter into a contract with the Climax Machine Company, of Marathon, for the above. The crusher is a 10x20 and the engine is 16-horsepower.

WHEELING LIMESTONE COMPANY.

Wheeling, W. Va., June 18.—The Wheeling Limestone Company is preparing to begin work upon the construction of its stone crushing plant at the second cut, near Mt. de Chantal, and a portion of the heavy machinery for the plant has already been selected. The first work will be the laying of a siding to the site of the plant and this will be started immediately by the Baltimore & Ohio Railroad Company.

WILL INSTALL ANOTHER CRUSHER.

Logan, O., June 16.—The Hop Hollow rock crusher stone plant has been sold by George Kirsch to a St. Louis contracting firm of which G. E. Wyckoff is a member. The latter will have charge of the plant here and has stated that a second crusher will be installed.

RECEIVER APPOINTED.

Norristown, Pa., June 16.—As the result of a bill in equity, filed recently, Judge Henry K. Weand has appointed C. Henry Stinson and John J. Bolger receivers for the John J. Bolger Stone Company.

REBUILD PLANT.

Mankato, Minn., June 20.—The stone crushing and air compressing plant of the Widell Company, which burned to the ground three weeks ago, has been rebuilt and again put into operation. Experts were brought from Chicago to examine the machinery and pronounced it undamaged by the fire. This will reduce the company's loss to about \$4,000. It carried no insurance.

WILL PUT IN CRUSHER.

Herndon, Va., June 19.—Dr. E. L. Detwiler, C. M. Lawrence and S. A. Hersperger have bought from Dr. H. B. Hutchison the Belmont Park property near Leesburg, on the Southern railway, containing about 75 acres. This property has a fine deposit of trap rock, which can be easily quarried, as it lies near the surface. It is the intention of the new purchasers to put in a rock crusher operated by steam power, and to quarry stone for road purposes on a large scale. It is planned also to organize a stock company to carry on the business.

WILL ENLARGE BUSINESS.

The Charlotte Quarry Company, Charlotte, N. C., has sold a half interest in its business to C. W. Requarth, of Lancaster, S. C. The new company will incorporate with an authorized capital stock of \$50,000. In addition to enlarging their facilities for crushing and furnishing all kinds of stone, they have ordered a complete equipment of machinery for making concrete products of stone dust and cement, including sewer and drain tile, curb, etc.

INSTALLS NEW OUTFIT.

Rapid City, S. D., June 18.—The Northwestern Stone Quarry Company is opening up a new crushing plant and has placed an order with the Allis-Chalmers Company for a No. 4 style "K" Gates gyratory breaker. This will deliver to a Gates revolving iron frame screen which will divide the stone into three sizes. A No. 4 style "B" elevator with 45' centers will be used to deliver the crushed product to storage bins.

WILL DEVELOP QUARRIES.

Hartford, O., June 1.—The Hartford Stone Company, an incorporation of Youngstown capitalists, will develop the immense deposits of sandstone on West Street in the Canfield Gully. Two dams will be erected of concrete. A 100-h. p. boiler is being installed. It is the intention of the management to

expend about \$100,000 in equipment, and the works will have a capacity of 100 tons per hour and will employ from 75 to 100 men.

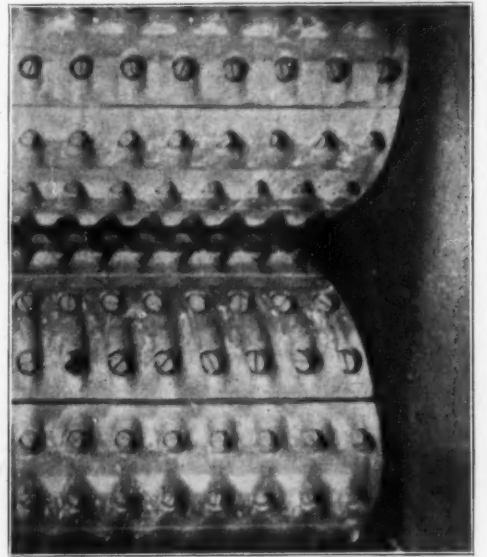
Gordon Cook is the superintendent.

NEW BOND ISSUE.

Chicago, Ill., June 10.—The Dolese & Shepard Company, one of the largest quarry concerns in Chicago, has filed a trust deed to the Commercial Trust & Savings Bank to secure an issue of \$900,000 in bonds running twenty years from April 1, 1910, at 6 per cent. The bond issue will be used to refund an outstanding issue of \$400,000, which were put on the market October 1, 1901, and the remainder of the amount to be raised will be used for additional working capital and for what further funds that may be required. The new issue is to be known as the general mortgage sinking fund, and they are to be in denominations of \$1,000 each. The deed provides that they are redeemable on any interest day five years after date on three months' notice. The mortgage covers all the company's lands, quarries, improvements, machinery and fixtures in Illinois, including its real estate, quarries and plants at Gary, Hawthorne, McCook and Naperville. The deed was made out by William E. Phillips as president of the Dolese & Shepard Company.

OPEN ABANDONED QUARRY.

Riverside, Texas, June 19.—H. Graham, of Houston, is considering the reopening of the old rock quarry here. There is an immense amount of good



THE EDISON ROLLS IN THE PLANT OF THE UNITED STATES CRUSHED STONE COMPANY, MCCOOK, ILL.

rock in this vicinity, and much of the rock used in the jetty work at Galveston was taken from here; but the quarry was abandoned several years ago. The rock is a good grade for concrete work and the supply is unlimited.

HAVE LEASED NEW QUARRY.

Carthage, Mo., June 19.—The Carthage Superior Limestone Company have leased the stone quarry belonging to M. F. Viernow, on the south side of Spring River, a little way west of Main Street. They will operate the rock-crushing plant connected with it.

WILL HAVE LARGE CAPACITY.

The installation of stone-crushing machinery for the Yosemite Stone Company at Exchequer, Mariposa county, California, is progressing rapidly under the direction of E. N. Greenleaf, the engineer in charge of the work.

When completed this crushing plant will be one of the largest on the coast. There will be four crushing batteries. The heaviest piece of machinery in the plant will be a No. 8 Gates crusher weighing 135,000 pounds. An immense locomotive crane, with a lifting capacity of ten tons, has been constructed for the company by the Union Iron Works, of San Francisco.

W. A. Neidamer and John Banti, of Charleston, Ill., have sold the Neidamer Stone Crushing Company's plant, near Charleston, to Arthur W. Fruit, of Michigan. Between \$40,000 and \$50,000 will be expended upon improvements of the plant, it is said.

JUNE 22, 1910.

ROCK PRODUCTS

4/

SCIENTIFIC LUBRICATION OF WIRE ROPE.

Quarrymen and, in fact, all users of wire rope are interested in the preservation of it to secure its greatest efficiency. Probably, if they knew that the matter of lubrication played such an important part in the life of a rope, they would give it closer attention. The Wire Rope Lubrication Company, Newark, N. J., in the American Wire Rope News, has the following to say on this subject:

The following illustrations indicate the unnecessary damage that may be caused by lack of care and proper lubrication. The corrosion is particularly noticeable in the inside wires of the strands, due to improper lubricants, which have failed to penetrate to the inside wires. These wires carry the greater part of the strain after the outside wires have worn and commenced to break up.



ROPE USED WITHOUT LUBRICATION.
STRAND FROM WELL LUBRICATED ROPE.

and unless properly protected cause the rope to give far less service than might otherwise be obtained. In fact their sudden failure might cause serious damage or even loss of life.

The scientific lubrication of wire rope is a matter which has not been given the attention it deserves. A few by-products have from time to time been placed upon the market without any particular reference to their special fitness for the varied conditions under which ropes are used, consequently results up to date have not been uniform nor reliable.

It is unreasonable to expect a protective coating or shield to lubricate, or a lubricant to act as an efficient shield. It is equally unreasonable to expect the same grade of lubricant to do as good work on a slow-speed rope under heavy loads, as on a high-speed rope under like loads.

A wire rope is very complex, requiring constant lubrication not only on the surface, but inside of the strands. The first question asked by any ropemaker, in the event of a complaint, is how was the rope lubricated? What was the condition of the inside wires? The matter of penetration to the inner wires is just as important as

that of lubrication on the outside wires. Many wire ropes fail because of the complete corrosion of the inside wires of a strand, while the outside wires are apparently in good condition.

In view of the fact that the failure of a wire rope may cause loss of life, as well as damage to property, the importance of thorough internal lubrication cannot be overestimated.

Every Lubricant Must Penetrate.

No great help can be expected from the hemp center. While it may have been thoroughly saturated in the beginning considerable lubricant is squeezed out during the process of rope making, soon leaving the rope dependent upon outside lubrication.

No Lubricant Should Run Off.

There is no value in a compound which will run easily and drip from the rope, leaving it practically dry after a few days in the hot sun. There are very few operations on which the ropes are greased every day, nor is there any real necessity for such practice where a properly selected compound is used, save in very exceptional cases. Consequently a lubricant should have a certain staying power, even at fairly high temperatures.

Every Lubricant Must Lubricate.

The fact that a grease is fairly heavy or thick does not necessarily indicate a good lubricant: on the contrary, many of the compounds possess no value whatever. A rope in use is continually subjected not only to the wear of the drums, sheaves or rollers, but there is a constant wear inside, due to the wires in the strands moving slightly, and to the edges of the strands touching and nicking when the rope bends.

Unless the lubricant can stick and form the necessary lubrication it might as well be dispensed with.

On the standing ropes of tramways and cableways this is particularly desirable and, while the wear of the travelers must be minimized, the sheaves must not be clogged or retarded.

What Constitutes a Proper Shield.

A proper protective shield should form a cover, protecting not only the outside but also the inside. It should not form a hollow shell capable of retaining moisture and drippings, nor should it harden quickly and flake off. A shield should be absolutely impervious to moisture and should remain plastic for a considerable length of time. It should, when applied, be able to penetrate sufficiently to reach the inside wires and to make a homogeneous coating.

Having these different points in view we experimented extensively with different compounds and after long experience in which we demonstrated very clearly that no one compound would answer for all conditions, we hit upon the following four preparations, each of which is perfectly adapted to the purpose.

Lubricator.

A moderately heavy-bodied compound, essentially a lubricant to be applied warm. Acts as an agent against dampness, moisture, mine water, etc. It lubricates, penetrates, clings to the rope.

For use on hoisting rope running at high speeds, and where heavy service is demanded, such as shaft and slope ropes, furnace hoists, conveyors, derrick falls, transmission and haulage, and general hoisting apparatus.



WIRES FROM INSIDE OF STRAND USED WITH-
OUT LUBRICATION.

Plumbago Grease

A heavy-bodied grease containing a high percentage of pure graphite. It can be applied less frequently than No. 1, on ropes less accessible, and is particularly effective on slow-speed ropes under heavy loads. It is recommended for crane, shovel, dredge and derrick ropes; also for ballast unloaders, tiller or rudder ropes on ships. Apply cold. Little affected by changes in temperature.

Protector.

A heavy protective coating, to be applied cold. An efficient shield against moisture, salt water, fumes, gases, etc. Especially suitable for ships' rigging, derrick guys, smokestack guys, guy and messenger strands, etc. Dark in color.

Elevator Rope Compound.

A light-bodied, fluid compound with slight, pleasant odor. High lubricating value. Applied cold in small quantities with a brush. Adapted to quick-running ropes. Compounded especially for elevator ropes.

We would here accentuate the necessity always to specify the particular usage to which a wire rope is submitted before securing the lubricant. In order to get the right results, because, as above stated, a lubricant that will work finely in one case will give no results whatever in another, not only injuring the rope but the reputation of lubricant. But where applied for the specific purposes above related, our extensive experience warrants us in guaranteeing the results claimed.

The stone crusher and mineral wool plant of A. Sidney Rambo, at Swedeland, Pa., was destroyed by fire recently. Loss, \$3,000.

Francisco Brothers Crushed Stone Company has been incorporated at Little Falls, N. Y., with a capital stock of \$100,000, by J. H. Francisco, S. G. Francisco, E. E. Francisco, all of Little Falls.



SIMILAR ROPE WELL LUBRICATED DURING
ENTIRE TIME OF SERVICE.

The Lawton Limestone Company has been incorporated at Lawton, Ky., with a capital stock of \$20,000, by J. A. Lane, H. B. Campbell and L. C. Turley.

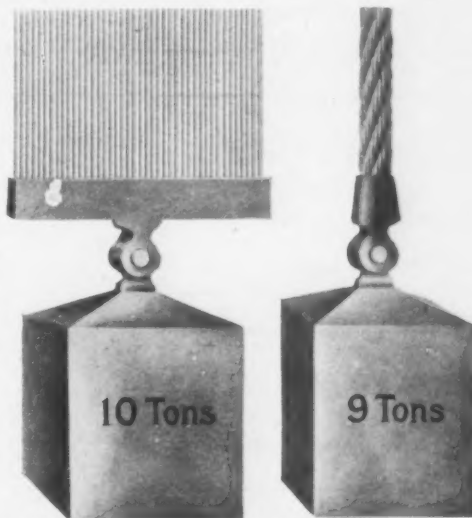
The Springfield Crushed Stone Company, Springfield, Ill., has been incorporated with a capital stock of \$5,000, by W. R. Kelso, George F. Knox and Nettie L. Kelso.

STANDARD BREAKING STRENGTHS.

Makers of wire rope have adopted a standard which will hereafter govern the manufacture of this material. The American Wire Rope News has to say regarding this:

The method employed in measuring the breaking strengths of different forms of wire rope manufactured in the United States has heretofore been based upon the individual wires in the rope and the public has become used to this method of figuring. The figures of breaking strengths based upon the average of the different sizes and kinds of wire rope as obtained by actual tests on a large number of specimens and American wire rope will hereafter be sold only upon the tables adopted May 1, 1910. These figures now represent the standard adopted by all makers of wire rope in the United States. In no case has the intrinsic strength been reduced, but the new method of figuring is adopted and published to meet the desire for more convenient and direct figures.

We illustrate a 10-ton and a 9-ton weight, the former supported by 42 wires and the latter by the same wires, when laid into a rope. The reason for loss of one ton capacity when the wires are put into the rope is because of the indirect pull upon the wires and, further, because all the wires are not always under the same stress at the same time. To secure flexibility and durability, the laying of the wires into rope form necessarily carries with it this loss of strength. Yet the practice of all manufacturers and users of wire rope in this country has ever been to make calculations upon the strengths of the wires rather than upon their actual capacity when twisted and shaped into a rope.



CAPACITY OF 42 WIRES AND WHEN LAID IN
ROPE.



SAME ROPE OPEN TO SHOW INSIDE WIRES.



KELLASTONE

New Material for Modern Construction Has Passed Beyond Stage of Experiment.— Becoming Important Factor in Building Lines.

One month ago the first flat roof of Kellastone in Terre Haute, Ind., was put on the Ball Building, a two-story brick structure on Ohio Street used for store purposes. The front of the structure is faced with Kellastone and shows the artistic features of this material, beautiful and pleasing to the eye, and durable, practically, for all time. Kellastone, made of Kellastone cement, is simply a purified concrete.

The roof, made of the same material, is smooth, firm as a rock, resilient, is without seam or crack, possesses the quality of being positively fire and waterproof and is a non-conductor of heat and of cold. Architects and engineers who have examined this roof pronounce it superior to any roofing that has been used in the past. The U. S. Kellastone Company guarantees its durability as long as the walls of the building stand. It appears and is perfect in every desirable detail. Its marvelous strength and resistance to crushing and cross breaking make Kellastone particularly desirable for roofs and floors, having a crushing strength of 30,000 pounds per square inch and is light, weighing less than most of the modern roofs.

Particular care was taken before covering the roof with Kellastone, to see that all rafters and plates were securely spiked and braced in their proper position. The rafters were covered with board strips $\frac{3}{4} \times 3$ laid horizontally $\frac{1}{4}$ of an inch apart, securely nailed at each bearing with two nails. Over each valley, hip, ridge and comb was placed a strip of expanded metal, with a 6" lap or bearing on each roof surface, and securely fastened to sheathing strips with wire staples. At fire walls and copings all possible shrinkage expansion and settling was taken care of by a strip of roofing felt or rubberoid 6" wide, attached with a 2" lap or bearing on the roofing strips and 4" bearing on the fire wall and coping. Above this a flashing strip of galvanized iron, extending down and projecting over the felt strip, was securely fastened into the wall. Kellastone gutters were at-

tached securely, set at right angles to the roof surface, firmly attached to the sheathing and pitched sufficiently for drainage.

Three months ago Kellastone flooring was laid over the old floor in the Terre Haute pumping station. The floor, base board and border are all of one piece. It is among the handsomest floors in any of the public buildings in Terre Haute. In the construction of these floors a special Kellastone filler is mixed with the flooring material, which acts as a buffer and cushion for the top coat and has a soft tread, alleviating the rigidity common in monolithic floors. The floor and base board are all constructed as a whole, with a concave connecting mould, no corners to collect filth, dirt or germ life. It is easy to keep clean and is absolutely sanitary in every respect. Care was taken, covering the old floor of the pumping station with Kellastone, to see that the joists were in good, sound condition. Then the old flooring was covered with common building lath set $\frac{1}{4}$ of an inch apart, with broken joists, double nailed and the Kellastone applied much like ordinary mortars or plasters on lath. The same method is used for inside or outside walls of structures.

Kellastone was introduced in Terre Haute not quite a year ago by its inventor, E. F. Kellie, president of the U. S. Kellastone Company, from whom it took its name. Many houses in the residence portions of that town have been built of this new material, which has given entire satisfaction and become very popular. A New York architect is now drawing plans for a handsome residence to cost \$12,000 and to be built this fall on South Center Street, Terre Haute, one of its prettiest residence districts, for Mr. Kellie, president of this company.

Mr. Kellie has established branches of the company doing a large business in Louisville, St. Louis, Toledo, Omaha, Kansas City and Denver; organized last winter a £1,000,000 company in London, England, and sold the company's rights of patent in Canada, in Winnipeg, Manitoba, Moose Jaw and Saskatchewan. These companies operate under the name of the Canadian Kellastone Company and Moose Jaw Kellastone Company, doing a big lot of work.

Professor W. H. Hatt, chief of the engineering department of the Purdue University at Lafayette, Ind., wrote President Kellie last May: "I wish to congratulate you on the results of the tests on Kellastone. By reference to the report you will see that your roofing and flooring plaster have passed the rigid requirements of the New York building law."

The superintendent of the Missouri Malleable Iron Company wrote President Kellie last April that they had tested three samples of his roofing material with results so gratifying that he desired him to quote prices for putting on a roof on each of four of their furnace buildings at East St. Louis. These buildings are about 45' square, and he believed the Kellastone roofing should be put on the inside of the roof in the

form of a ceiling, in order to give them the protection against fire which they require.

This new building material—Kellastone—is suitable for all kinds and classes of construction. The cost of this material as compared to wood for an entire building; exterior, interior walls, floors and roofs over a wood frame, is about the same as an all wood structure with two coats of paint. As compared to brick or stone it is much cheaper. It can be applied in any color. Pigment is mixed with Kellastone cement and volatile oils and applied to the walls as a last coat with a brush and burns itself into the wall to such an extent that it can never be removed, fade or corrode.

This new building material has passed the stage of experiment and doubt and will become one of the important factors in building lines in this century.

IMPORTANCE OF PLASTERING.

That the proper plastering of a building is given entirely too little consideration by the building public and that many people would be willing to pay more for a good job of plastering if they understood the importance of this part of construction is the belief of William Exworthy, business agent of the plasterers' union of Minneapolis.

Mr. Exworthy has been in the plastering business in Minneapolis for the last twenty years, and gives the following as the result of his observations: "The plastering of a building, whether a home or business block, is one of the most vital points that enter into the integral part of the construction. Although the cost is small as compared to the other materials and workmanship it should be the aim of anyone who is having a job of plastering done to see that he gets results for the money expended on this part of the building.

Many of the parts of a building are covered up and are not visible, still it is important that the workmanship and material should be just as good as the rest. On the other hand, plastering is in plain sight and a poor job is an eye-sore all the time, while a good job is a joy forever. Some may say, "Oh, I am going to decorate anyway," but decoration will not straighten out crookedness or baseline or make the finished woodwork fit close to the wall as it should in order to have a pleasing effect. Money that may be saved on a poor job of plastering is more than doubly lost by the appearance of the decorations.

"Plaster, properly mixed according to the directions sent with all hard wall plasters and applied to an average thickness of one-half an inch, has great fire resisting qualities and will stand an enormous amount of heat before it will crumble. From this point of view alone it should be entitled to the most careful consideration of the home-builder.

"From a sanitary point of view, a good job of plastering has no equal in the prevention of dirt and disease. There are no joints for insects or vermin of any kind or breeding places for diseases. This is true, no matter whether the material used is of the many hard wall plasters that are on the market or ordinary lime mortar, providing the plastering is properly done.

"The cost of plastering as it is done today, like many other works of construction, depends somewhat on the fluctuations of the market of the materials used. But it is safe to say that a good job can be done for twenty-eight cents a square yard for ordinary flat work. If metal lath are used instead of the wooden, the price increases in ratio to the quality of the lath used. It is necessary to take into consideration the conditions governing the different surfaces to which the plaster must be applied in computing the cost. Surfaces that are not of the flat kind are harder to work on and some are hard to get at. Not only the material but the time taken to apply it influences the cost.

It would pay the house-builder to bear in mind that considering the importance of the plastering, that the best is none too good and that a cheap job would be cheap at any price."

FISHACK MILL COMMENCED.

Port Clinton, Ohio, June 20.—The Fishack Plaster Company has begun work on its new mill at this place, which we believe will be one of the largest in the country.

MIXING PLANT IN OKLAHOMA CITY.

Oklahoma City, Okla., June 18.—William P. and H. A. Bannon, owners of the Standard Wall Plaster Company, of Louisville, Ky., have announced that they will build a plaster mixing plant in this city. It is to be located on the C., R. I. & P. railroad. They intend to put up a two-story brick building and arrangements for the construction are to be made as soon as A. P. Bannon arrives in this city.



KELLASTONE ROOF ON THE BALL BUILDING, TERRE HAUTE, IND.

FROM OUR OWN CORRESPONDENTS

BUFFALO.

Buffalo, N. Y., June 18.—While there have been one or two disturbing elements which have caused ripples in the usually steady and peaceful condition of affairs, they have had no great detrimental effect on business, and it may be said without reserve that the year 1910 will be the greatest and most prosperous yet experienced.

The two chiefs, and perhaps the only, drawbacks the trade has sustained this year have been the unfavorable weather conditions and petty labor strikes. But, fortunately, both these have been overcome, and the present conditions are better than the most sanguine had anticipated.

For about a month the contractors had been greatly handicapped because of a strike among the Italian laborers, which resulted in numerous petty riots at various building operations where the employment of Polish strike-breakers was attempted; but the strikers and employers got together the other day, with the result that there was a satisfactory settlement of the differences between the two factions, so that now everything in the trade is serene and one can see the rapid strides of progress that are being made.

Frank Hossenlopp, of the Buffalo Sandstone Brick Company, says that business this year is the best his firm has ever known. "We are selling our goods as fast as we can make them," he said. "We are getting business right and left and are 'way ahead of 1909. Why, even now there is enough business in sight to keep us busy up to the first of September." Mr. Hossenlopp said that his firm expects to close contracts in a day or two for furnishing the brick for two large jobs, but he did not care to state the particulars concerning them until the matter is fully settled. He did say, however, that one of them is for the erection of a Buffalo church, which will call for about half a million bricks, while the other is a job of about half that size, in Tonawanda.

H. Schaefer, manager of M. W. Reeb & Co., said that while the firm has no particularly large jobs on hand there are a number which will keep them busy all the time. He said that the company was affected somewhat by the weather and the strikes, but that now everything is settled, business generally is picking up.

The Buffalo Cement Company has several important contracts of fair size in view. They report unusually good business this spring, the only drawback having been the bad weather.

An appropriation of \$1,129,600 for work in Buffalo harbor, Black Rock harbor in this city, the Niagara river and other improvements at this end of Lake Erie, is contained in the river and harbors bill which has just passed the Senate at Washington. In addition to local improvements, there will be provision for the following contracts: For improving the harbor at Dunkirk, N. Y., \$99,275, provided that satisfactory assurance shall have been received by the Secretary of War that the local authorities will construct a concrete dock or other suitable terminal facilities; improving the harbor at Charlotte, N. Y., maintenance and continuing improvements, \$71,680; improving harbor at Erie, Pa., \$70,000.

The State Highway Commission at Albany, N. Y., has awarded contracts for nearly \$200,000 of good road work in Erie county, New York, in the vicinity of Buffalo: State Farm-Collins road, Stanley Construction Company, \$5,977; Hamburg village road, Blasdel road, Frank V. E. Bardol, \$2,100; Aurora road, F. B. Brotsch, \$30,198; Aurora (No. 2) road, F. B. Brotsch, \$94,000. The commission has awarded the contract for repairing Orchard Park road, section No. 5, near Buffalo, to John E. Johnson, of this city, for \$6,913.

At Albany, N. Y., the New York Central Railroad Company has applied to the Public Service Commission for authority to construct a cut-off, branches and connections in the city of Rome, N. Y. The plan includes a change in location of the passenger station of the road, and grade crossings will be avoided. It is understood the work will involve an expenditure of \$2,500,000.

At Niagara Falls the board of water commissions has signed the contract with the Norwood Engineering Company for a city filtration plant to cost \$234,000.

The Dunkirk (N. Y.) Construction Company has been incorporated at Albany. The directors are Charles D. Armstrong, Louis J. Fleischmann, Peter F. Meister and Thomas P. Heffernan, all of Dunkirk.

It is estimated that 300 houses will be erected at Niagara Falls this season. It is said that Burt Van Horn and other New York men intend to erect 100 brick houses there. John C. Stricker, it is said, will erect fifteen or twenty houses this year, and Max Oppenheim is also building many houses at Niagara Falls.

The village trustees of Le Roy, N. Y., have decided to continue the old plan of drawing crushed stone for the village streets by team instead of taking the proposition offered by John Heimlech to provide an engine and two steel cars and draw the stone for 40 cents a ton or \$17.50 a day. Concrete crosswalks will be built in that village. Work has begun at the main road west of Le Roy. Crushed stone for the road is being hauled from the plant of the General Crushed Stone Company.

The Henry P. Burgard Company, of Buffalo, has begun in this city the construction of a new viaduct over the West Shore tracks at Bailey Avenue. The total cost of the new structure will be in excess of \$100,000.

It is reported that M. J. Hogan, of Port Colborne, Ont., a Canadian town a few miles from Buffalo, has secured the contract at \$74,000 for Welland canal improvements at Port Colborne.

At Ottawa, Ont., recently, Vickers Sons & Maxim filed with the Canadian government plans for a \$2,500,000 shipbuilding and repairing plant at Montreal. The plans show a floating dock with a lift of 27,500 tons, capable of handling boats up to 700 feet, a special repair berth, and three shipbuilding berths.

In Elmira, N. Y., Contractor John C. Williamson is building a business block for Schweppe Brothers, of that city.

The H. P. Burgard Company, of Buffalo, has secured a paving contract at Niagara Falls.

City Engineer McClanathan, of Niagara Falls, has submitted an estimate for extending the Twenty-second Street sewer in that city through the North End factory district to Niagara river. His estimate aggregates \$106,000.

The contract for deepening Welland river has been let to the General Contracting & Construction Company, of Toronto, Ont. This stream is located in Canada only a few miles from Buffalo.

Lyne & Herley, contractors, of Fredonia, N. Y., were successful bidders for the big piece of state road to be built this summer in the town of Hamburg, N. Y. Their bid was \$47,500 for one mile of brick pavement.

A church constructed of concrete blocks faced with red Medina sandstone has been built in Sloan, N. Y., by Charles B. Gould, of that village.

The Niagara Falls architects have perfected an organization with George E. Wright as president and Simon Larke as secretary.

In the United States court in Buffalo recently William J. Young, a contractor and builder, of Rochester, filed a bankruptcy petition. He owes \$16,213 and has \$3,428.

It is reported that the Frontier Electric Railway Company may build a trolley line from Buffalo to Niagara Falls.

The H. P. Burgard Company, of Buffalo, has begun a contract to build a viaduct which will carry Bailey Avenue of that city over the West Shore railroad tracks. Much concrete will be used in the structure. The Burgard contract for the approaches to the viaduct is for \$78,000.

According to New York State Geologist John M. Clarke, the gypsum mines of that state last year had an output of 378,232 tons, the largest ever reported. Development in the industry in the western counties of New York state has been responsible chiefly for the increase. The report of Mr. Clarke includes the following: "The hydraulic cement industries reported a product valued at \$2,122,902, a little less than in 1908, when the valuation was \$2,254,758. A decreased output was reported by the natural rock plants, the total amounting to 549,364 barrels, against 623,588 barrels for 1908. That industry has shown a steady decline for a number of years past. The manufacture of Portland cement, on the other hand, gained slightly, with a production of 2,061,019 barrels, against 1,988,874 barrels in the preceding year. A considerable increase in the production of this material may be expected for the current year."

Cramp & Co. have been awarded a contract for the new office building at Forty-second Street and Fifth Avenue, New York. Estimated cost, \$200,000. The same company has a contract for erecting a new school house at Newark, N. J., at a cost of \$120,000.

PHILADELPHIA.

Philadelphia, Pa., June 18.—The Portland cement trade in this immediate locality has taken a sudden drop, but all manufacturers report an enormous business generally throughout the eastern territory. Prices are advancing.

The Whitehall Portland Cement Company has temporarily closed its plant while making extensions and additions to increase their output.

H. M. Fetter, second vice-president of the William G. Hartranft Cement Company, states that they are exceptionally busy outside of the Philadelphia territory.

The American Cement Company reports it is having a steady demand for its "Giant cement," which is being used in many of the larger operations.

Estimates are being made on the building of a new school house at Sixth and Hunting Park Avenue, which will be constructed of brick and reinforced concrete.

H. E. Grau & Co. are receiving estimates on a machine shop 225'x312', an office building 60'x100' and a power house 50'x70', to be constructed at Fifty-sixth and Lancaster Avenue, for the Standard Roller Bearing Company, at a cost of about \$110,000.

The Federal Engineering & Construction Company, Philadelphia, has been incorporated under the Delaware state laws. Capital, \$50,000.

CLEVELAND AND NORTHERN OHIO.

Cleveland, O., June 17.—Building operations in Cleveland continue fairly satisfactory and there seems to be no diminution in activity among the contractors and the companies which handle building materials of all kinds. While the projects are none of them unusually large, there are some of good sized proportions, and the volume of small jobs is very heavy. Residences are going up at the rate of from fifty to seventy-five a week in all parts of the city, and there is a distinct tendency towards the semi-fireproof and fireproof types of dwellings.

Cement dealers are well pleased with the volume of business done thus far and look for it to continue well into the fall. Cement holds steady despite some keen price-cutting which is being engaged in by some of the dealers. Cement in big orders is selling at from \$1.05 to \$1.15, according to brands, while for wagon deliveries it is bringing an average of about \$1.25. Most of the dealers this year are allowing only 7½ cents for returned sacks, as against 10 cents a year ago.

A row is on here between some of the mason contractors and the city building inspector over the quality of mortar used in some of the big buildings now under construction and the methods followed in inspecting them according to the city's building code, which is a model one. The contractors declare that some irresponsible contractors who take jobs at prohibitive figures used a weak mortar of sand and lime, whereas they should have used a good grade of Portland cement and sand. It is asserted that some buildings recently erected are all but ready to fall down.

The Builders' Exchange leaves on June 21 for a four days' outing at Conneaut Lake, Pa. The time will be spent in a general jollification, with aquatic and field sports and various other amusements. Nearly all of the builders and supply men will participate in the outing, which is an annual affair.

One of the largest contracts let during the past month was for the new Anshe Chesed temple. The general contract was given to John Grant & Sons for over \$100,000. The building is to be of pressed brick with stone trimmings. Much of the interior will be of reinforced concrete, including the floors. The building is to be finished in a year's time and is to cost \$200,000, complete.

A \$60,000 addition is to be made to Fern Hall, an aristocratic apartment house on Euclid Avenue, owned by R. M. Burrows. It will be five stories high and 152'x200' in size. Shale brick and terra cotta, with reinforced concrete, will be used. Plans were made by Knox & Elliott and contracts will be let during the coming month.

A great concrete exposition building, costing a quarter of a million or more, is planned for Cleveland. F. F. Prentiss, who will return early in July from a trip abroad, is to incorporate a company to erect it. Much of the necessary stock has already been pledged. The building is to be used as a permanent exposition building and convention hall, and may be one of the largest of its kind on the continent. It will be wired throughout for "live" exhibits of all kinds, so that a great variety of shows and exhibitions can be held in it from time to time.

Work has been started by the Hunkin-Conkey Company on a \$75,000 fireproof storage warehouse for the Fireproof Storage Company, on Euclid Avenue near the Nickel Plate tracks. It will be one of the largest and most complete in the city. The Eagle Storage Company, recently burned out of its home, has let a contract for a \$75,000 fireproof warehouse to the Masters & Mullin Construction Company, on Eagle Avenue. Plans for it were prepared by Architect E. E. Smith. It will be of reinforced concrete, with curtain walls of brick.

There is great activity in school building in Cleveland. Plans are nearly completed for a new \$300,000 technical high school for the West Side, and four grammar schools are being built. Three suburban villages about Cleveland are erecting new school buildings, and the Laurel school, a private institution, is making a \$20,000 addition.

The Electric Controller Company has purchased nine acres in Newburg and will erect a fine new plant there next spring. Plans are to be prepared for it during the coming summer. It will be largely of reinforced concrete, according to the present plans.

The Euclid Huron Improvement Company plans a large four-story mercantile building for Euclid Avenue opposite East Seventeenth Street. Plans have been prepared by Lehman & Schmitt. The building will be 162' front and 190' deep, and of reinforced concrete. The concrete work has been designed by the Courteny Emerson Company.

EVANSTON AND HIGHLAND PARK.

Chicago, June 21.—These two cities but a few miles north of Chicago and practically suburbs of the same, are enjoying a healthy prosperity which is made apparent in their steady growth and happy contentment of their inhabitants. Neither has experienced a boom in building operations in any month this year, but both have added steadily month in and month out to their pretty and stately residences and public buildings. This activity is said to be fairly assured even during the approaching summer months, and to continue to the close of the year. Its builders' supply dealers are active and energetic men who have done this spring and are doing now a thriving business.

"J. D. Wittington, Jr., has been rushed with business this month, more so than he ever has been since he started in business in Evanston," said H. Diestel, his manager. "Building operations are active and from all indications will continue so during the summer and to the close of the year. Much work is being done laying concrete walks here, in Wilmette and Kenilworth and also underneath the subways of the Northwestern Elevated road. All the foundations of structures erected this year have been of concrete. Having furnished cement for much of this work we naturally have been kept busy. We are moving right along and believe that conditions in the trade generally could not be expected to be better."

Eight hundred feet of running fence, eight feet high, surrounding the big coal and building material yard of the Peabody Coal Company at Evanston, has just been finished. It is painted in buff color, with green trimmings, and looks very attractive. It is braced every eight feet, the bracing going down four feet under ground and running up five feet above ground. It is a most substantial piece of work. A. H. Apps, manager of the builders' supply department, said: "We intended to make other improvements this month but business was so rushing that we could do no more. Our warehouse, in which we had more than fifteen carloads of cement three weeks ago, is emptied. The demand has been unexpected for June and, while I do not believe this will keep up, I feel certain we will be busier this summer than we have been in years. Among the large jobs we have gotten this month which helped to empty our warehouse was the addition to the Central Street school at North Evanston and we also delivered 3,500 barrels of Universal Portland cement to the Noel Construction Company for the First M. E. Church in Evanston."

The Highland Park Fuel Company, established several months ago, has built up an immense business in builders' supplies in the short time it has been in business. This new concern is under the energetic guidance of J. J. Parker, manager, and E. T. Maechtel, assistant. Mr. Maechtel said: "Business has been fully up to the top mark, as much so as it was during the busy month of May. Building operations are active and are likely to continue so during the summer months, from all appearances. We have just completed building our warehouse, up-to-date in all details. We store in it 750 barrels of Universal Portland cement and 200 barrels of the United States Gypsum Company's plaster. We have a splendid business and believe bright prospects are ahead."

CHICAGO

Chicago, June 20.—Very favorable conditions characterized the opening of the cement trade early in the year, and great activity and heavy demand have been felt in Chicago as well as throughout the country, month succeeding month. June is no exception to this condition, although for several weeks the demand fell off in this city as a result of the steel workers' strike, which halted all building operations. The strike, it is said in some quarters, came at a most opportune time for cement manufacturers, preventing them from being swamped on deliveries. As soon as the strike was settled building operations recommenced and the demand for cement followed, closely reaching the top notch of two months ago. Prices advanced 10 to 20 cents a barrel in the last 30 days and are firm, showing no indication of weakening; in fact, there is a tendency of an upward movement.

Builders' supply dealers throughout every section of this city have done a large business during the spring season, better than any year since 1906. In some parts of the city spring building has been finished and building operations are quieter this month than last, which has had the effect of lessening the demand for building material, but not enough to produce dull times for the dealers in these sections. The greater percentage of building material dealers are doing a normal business, and expect to during July and August, for the reason that in their territory building continues practically as active as it was in the earlier part of the year. The quieting down of business now, just before entering on summer, is natural and means this year that they are not rushed as they were two months ago, but are kept comfortably busy.

Sand and gravel men are getting their second wind after the settling of the steel workers' strike. The demand is fast reaching proportions of two months ago, which they have good reason to expect to continue to the close of the fall season. Prices are only fair and not as high in proportion as other material in building lines. Conditions in all building lines continue excellent this month, with bright prospects for an active summer and very busy fall season.

"The demand for cement this month was as great as ever, no signs of falling off," said George W. DeSmet, distributor of Vulcanite Portland cement. "The steel workers' strike could not have come at a more opportune time for us. Had it not occurred the demand for cement in Chicago would have swamped us, I believe. Conditions in the trade leave nothing to be wished for, and we will have as good, if not better, year than that of 1906. The prospects are simply splendid."

Gold Williams, of the Marquette Cement Manufacturing Company, said: "Conditions are as good as they were in May. The demand is good in city and country, and it is probable that a shortage may result should the demand continue as great as it was the earlier months this year. Prices are stiff and every indication pointing to no weakening. It looks as though this will be one of the best years the cement trade has had."

E. J. Winslow, of the Hydrolithic Cement Company, spoke of trade conditions as exceedingly fine and that he found in his line a boom on the contracting end and the demand for his product heavy and active, with the prospect of busy times right along. He said: "I am taxed to the utmost to make prompt deliveries and shipments are heavy. Conditions are as healthy and warm as the June day sun."

"Everything in the cement market today is as favorable as it was a month ago," said Edward L. Cox, general sales agent of the German-American Cement Works. "The demand is active and strong and the tendency of prices is upward. This will be one of the active years in the Portland cement trade."

"All the western mills are running to full capacity," said D. Richter, western manager of the Alpha Portland Cement Company. "There is a heavy demand in Chicago and the same holds good throughout the country. This season has started more favorably than any year since 1906 and I believe it will continue to the end of the year. Prices are firm, there is no talk heard of any cutting done, and unquestionably the tendency is towards higher levels."

"Conditions are in fine shape, nuff sed," is the way B. F. Affleck, the energetic sales manager of the Universal Portland Cement Company, sized up the cement industry for the month of June. "Many

shipments, good demand and firm prices are the characteristic features of the market. This is a great year for cement."

"Conditions fine, never better, everybody is putting cement into everything, we are even feeding it to the chickens," said J. U. C. MacDaniel, of the Chicago Portland Cement Company. "If the demand keeps up as it has in past months there is likely to be a shortage, but this, of course, is mere guesswork. Prices are firm and are not likely to weaken in the immediate future."

John G. Evans, of the Atlas Portland Cement Company, said: "Conditions are every bit as favorable this month as the earlier part of the year. The demand is good and seems continually to keep on the increase. Prices are firm and everything indicates that this will be one of the years which will pass into history as a record breaker."

"Business is slowing down a little the last two weeks," said J. B. Tuthill, president of the Tuthill Building Material Company, "both at this yard, 227 W. Sixty-third Street and Forty-seventh Avenue and Harvard Street. From present indications I should say that there will be a great deal of building done all summer in the territory surrounding our two yards, not as much perhaps as during the busy spring months, but plenty to keep us busy, where in former years we had little to do. The higher prices of cement in the last three months have not checked building operations, nor will they interfere with contemplated plans. The outlook is decidedly very promising."

The Crescent Material Company's affairs are under the management of J. B. Coates. This concern's teams have been very busy hauling lime, Universal Portland cement, plasters and all kinds of building material to jobs in the Hyde Park district. It furnished material to five thirty-six flat buildings, among the largest erected this spring. Business is easing up some now.

"The demand for building material has been as brisk, and our teams have been as busy delivering cement, lime, plaster, etc., to jobs as in May," said Walter L. Woods, president of the Standard Material Company, at Sixty-sixth Street and Lowe Avenue. "There seems to be no indication of the demand slowing down. We hear our customers talking of new contracts almost daily and looking about this territory within a radius of two miles lots of work can be seen going up. Of course, we expect some quiet times in July and August, but we assuredly have not struck them so far. Everything is running smoothly and looks good."

H. O. Heitman, at the head of the Union Coal, Lime & Cement Company, at Ashland Avenue and Fifty-ninth Street, is said to be fairly well satisfied with business this month. It is understood that in the last two weeks the demand for building material came by fits and starts, but on the whole was nearly as good as in May. Prospects are considered promising.

W. N. Carter, of the Chicago Contractors' Supply Company, located at 5835 Loomis Boulevard, said: "All this territory west of us has been building up rapidly this spring and will continue to do so all summer. We have found the demand for cement, lime, plaster, etc., as brisk this month as in May. There are no indications of quiet times ahead of us. Our business has been increasing steadily. We hear of much talk among contractors of new jobs to be done in the next two months. Conditions in the trade can be O. K.'d without fear, I believe."

"Business has been quiet this month," said Morris Koch, secretary and treasurer of the Marquette Cement Company. "As a rule," he continued, "June is a brisk month, but on account of building starting in a month earlier this year it has stopped a month sooner than usual. Otherwise things look well; we are busy, but not as busy as we were in May." "You may add," broke in Mr. Farley, "that while things have been more quiet the last three weeks than in May, business was far better than last year this time."

The Templeton Lime Company report a rushing business this month, the same as in May, with no prospect of its toning down during summer. Within a radius of two to three miles of Homan and Grand Avenues, where their yard is located, buildings are going up practically in as great numbers as during the busy spring months. It is heard and believed on all sides that much building will be done all summer. The company's reports are full of cheer and optimism.

P. T. Britt, of the J. J. Croake Company, whose yard is located at 2929 W. Fullerton Avenue, is closer in touch with building operations in that part of Chicago than most men and one whose judgment is usually correct and conservative. He said: "In our territory there has been something like a boom in building this spring, with present indications of great activity in building lines all summer. Our

teams are as busy delivering material to jobs this month as they were during the phenomenal active months of March and April. The demand for our concrete building blocks has increased and prospects for a brisk business to the close of the year are very fair. Advanced price of cement does not weaken building enterprises."

Alfred and Otto Frerk announced on June 1 that on the death of their father, Henry Frerk, they had taken over all the business conducted under his name at 3101 to 3135 Belmont Avenue, and will continue such business under the name of Henry Frerk Sons, in the same manner and at the same place. "Building operations which commenced early last March were more extensive in this territory than any two years in the past, calling for large quantities of building material, especially cement, which made our spring season's business exceptionally brisk," said Otto Frerk. "It is falling off some and by contrast makes this month appear quiet. Indications are the fall months will see more structures going up than in the earlier part of the year, and we will have our hands full. Everything looks good."

A. J. Druceker, of N. J. Druceker & Co., said: "Conditions are excellent and business is good this month. Of course, there has been a general falling off in the demand for all building materials, because buildings put up this spring are finished and building operations in the northwestern territory of this city will not start up again till August. But there will be great activity then and we will sell lots of cement, plaster and lime. The sharp advance in cement the last thirty days has not checked owners and builders in the least. They are maturing plans for more extensive building operations in this section, which has not experienced such activity in years. We expect a rushing business commencing about September. Our spring season has been excellent and the fall season from present indications will prove better still."

"Our yard at 2144 West Forty-seventh Street is not large enough to handle the business we are doing," said J. Golombiewski, treasurer of the Lake Building Material Company. "The spring season, the first one since we opened operations last winter, has been far better than we expected, and this month is holding up remarkably well, considering that this is now the off season. Spring building being finished and fall building not commencing till September, still we are supplying steadily an active demand for cement and other material. We will extend our yard one block north to Forty-sixth Street, and build a switch track from the Chicago Junction road into the yard, and with the switch track from this road, which runs along our yard on the west, will then have the shipping facilities we need. Furthermore, we will gain quite a little ground, filling up the old hole of Tom Carey's brick yard, part of our property. Two hundred yards of material are dumped into it daily from our own teams, and we expect to have it filled in two months."

E. E. Wetzhold, manager of the F. Schultz Lime Company, said: "Business has been fairly good this month, though last week it was quiet. We expected things to be quiet in July and August, but not in June, which usually is active. Higher prices for cement have been no drawback except to contractors who lay concrete walks. They have bought less cement than they usually do. Contractors for buildings cheerfully pay present prices. I do not mean that we have found business dull, but I do mean to say we could have done much more. However, we will have our hands full after the middle of August."

The Chicago Clay Products Company reported no falling off in business this month. They have had a brisk demand for cement, sewer pipe, coping and flue lining. Building continues active in its territory around Forty-third Avenue and West Taylor.

George Troy Carpenter, of Carpenter & Browning, said: "We have experienced a better and more active month than in May, supplying the territory west and south of our yard, 4012 W. Taylor Street, with builders' supplies, flue lining and coping for masons. This is our principal business. We manufacture concrete sewer covers, chimney and pier blocks. We have just put on the market a new cement interlocking sectional catch basin block. We have been manufacturing this block a month and it takes well. It is cheaper than brick and makes a far superior catch basin. Collections are a little slower. We started our other yard at Forest Park this year. It is doing a fine business. It is operated under the name of the Forest Park Fuel & Supply Company, with the following officers: J. E. Decker, president; George Troy Carpenter, vice-president; R. H. Browning, secretary, and A. C. Miller, treasurer. We carry there a full and complete line of builders' supplies."

"June so far has been the best month we have

ever had, far better than April or May," said M. A. Staley, of the M. A. Staley Company. "From present indications I should say that building will keep up actively all summer, and naturally so will the demand for all builders' supplies. For instance, in the large territory where Victor Lawson held a great deal of vacant property for years in the vicinity of Arlington Place and North Clark Street there is a veritable building boom, and this is not the only spot, either, on the North Side. There is no kicking about the advanced price of cement; everybody expected it and knew it had to come; cement was too cheap. There are more busy times ahead of us."

B. A. Benson, manager for James E. Lill, at Bryn Mawr avenue and the N. W. Elevated tracks, said: "Business has been a little quiet this month, but we have been busy, and from present indications expect to be all summer. We have kept all our teams running, and everything looks brighter than it has for years."

J. M. Bower, manager of the Waukesha Lime & Stone Company's yard at Devon Avenue and Sheridan Road, said: "The demand for building material was brisk and active this month, showing no signs of weakening till a few days ago. This, however, does not mean that business is dull or will be during the summer months. It simply means this year that we will work under normal conditions, while in the spring months we worked under high pressure. Building operations throughout the north division of the city, especially near the lake shore, show no signs of sluggishness and will continue active where in former years they fell off till the fall. Our business is continually increasing. There will be no quiet or dull times."

George C. Marsh, of the Chicago Builders' Specialty Company, said that they were pleased with the volume of business they had had this month. Their specialties and concrete mixing machinery have found a ready sale and the demand is increasing fast this year. There is no question in his mind but what this year will prove an excellent one.

At the Chicago Union Lime Works Company business was reported as fine as last month and the exceptionally good demand for lime showed no decrease. Conditions were reported healthy and the outlook very bright.

J. C. Brentlinger, assistant secretary of the N. A. Williams Company, said: "While the demand for our Akron sewer pipe, fire brick, etc., has been good this month, prices are exceedingly bad and conditions in Chicago in this line demoralized. What with contending with keen competition, strikes and other things, the fall does not look inviting."

"There is no lull in business this month and no decrease in the demand for building material in this section of the city," said Charles P. Thompson, president of the Calumet Teaming & Coal Company, at Ninety-fifth Street and Exchange Avenue. "Indications point to a busy summer in building lines. We are very busy this month, making every team we possess do its full share of work. There may be a little falling off in trade between now and the middle of August, but nothing like the quietness we experienced at the same time last year. Conditions in the trade around here are good."

"June so far has proved a very fair month with us," said C. B. Scheffer, president of the Garden City Sand Company. "While there has been some let-up to business, it must be borne in mind June and July are always slow. The demand for building material is brisk, caused by the active building operations in all parts of the city, which bids fair to continue till late in the fall."

"A good volume of business has been our share of the trade this month," said Floyd M. Pierce, secretary of the Circuit Supply Company, which operates one of the largest building material yards in the South Chicago district. "We have been entirely satisfied with the volume of business, but not with the profits. Building material, the greater portion of it, is sold on altogether too close a margin of profit, and the only profit there seems to be is in the hauling. Building will keep up in this section of the city actively through the summer. We shall remain busy, I believe, to the close of the year."

"Business was good this month till a week ago, when there was a perceptible lull," said T. M. Tobin, of the T. M. Tobin Brothers' Company, which operates one of the oldest builders' supply yards at South Chicago Avenue. "That is nothing strange, as building slows down usually at this time. But this year probably will prove an exception and more than likely will be on the full jump again in a week. There is much figuring done and much work in sight, and local dealers will have all they can do to haul material to the jobs this fall."

F. H. Lazenby, of the Thomas Moulding Company, stated: "We could not expect much better business

than we have had this month. We make a specialty of all kinds of brick except common and the demand has been heavy. Prices are strong and advancing. Recently we raised the price of brick \$1 per thousand, which has had no effect on the large monthly sales. There are no indications of business falling off, and we feel that we shall keep busy for a while yet."

C. H. Brand, president of the Atwood-Davis Land Company, said: "Business improved immediately after the steel workers' strike was settled and became normal. This strike held up many building operations for several weeks and had a bad effect on the demand for sand. All this is over now, we are again as busy as we were two months ago, and conditions in the sand and gravel trade are excellent. Prices are fair and steady."

P. M. Richardson, of the Richardson Sand Company, said: "The demand for sand and gravel has been active this month. The steel workers' strike settled two weeks ago gives farther impetus to the industry. There are no dull times in sight, even in July and August. Prices are still too low, but strong at present quotations."

"Conditions are in splendid shape again since the settling of the steel workers' strike," said P. M. Lewis, secretary of the American Sand & Gravel Company. "For a month we felt this strike keenly, as it halted all building work and stopped the demand for sand. There is much work in sight for which great quantities of sand will be needed, and I feel that we will not only have good business in the fall but will have a busy summer. Prices are firm but too low for the profits we are entitled to."

"There has been a halting in building operations for three weeks owing to the steel workers' strike and a consequent decreasing demand for sand and gravel," said J. S. Putney, of the Lake Shore Sand Company. "The strike settled, business is normal again and prospects are fine for good business to the close of the year. We find prices steady and fair."

The Krug Sand Company has sold to the Wisconsin Lime & Cement Company a tract 599 by 120 feet on Forty-fifth Street at the southwest corner of Jackson Street, comprising twenty-four lots, for \$30,000, subject to a mortgage of \$10,000, assumed by the purchaser. A large plant will be erected.

R. T. Spencer, of Spencer Brothers, manufacturers of sewer pipe, firebrick, flue lining, etc., reported business good this spring, but some perceptible falling off in June. Prospects generally are fair, with the exception of prices, which are not as good as they should be.

MILWAUKEE AND WISCONSIN.

Milwaukee, Wis., June 17.—Among the recent orders which have been received by the Allis-Chalmers Company for crushing machinery are the following: The Edward Balf Company, Tariffville, Conn., one No. 6 Gates breaker, a No. 4 breaker and a No. 6 elevator; the Clinton Point Stone Company, New Hamburg, N. Y., one No. 21 breaker; the Massachusetts Broken Stone Company, one No. 6 Gates breaker; the Equitable Securities Company, Kingsport, Tenn., crushing and cement machinery and electrical power equipment for same.

The Ideal Lumber & Fuel Company, of Appleton, has contracted to furnish the crushed stone, sand and other material necessary to be used in the construction of a sheet asphalt pavement at Appleton. The pavement will be built by the J. F. Hill Company, of Chicago. It is expected that over 300 carloads of crushed stone will be used in the construction work.

At a recent meeting of the committee on streets and alleys, of the Milwaukee city council, action was taken that may close the city to all asphalt pavement builders. At the next meeting of the council a resolution will be introduced providing for retaining Prof. F. O. Hotchkiss, an expert in the employ of the state highway commission, to come to this city and make an investigation and report upon a plan for the systematic laying of pavements on the Milwaukee streets. According to Mayor Seidel it would cost \$26,800,000 to pave the city streets.

The Withee Lumber & Fuel Company, of Withee, has added a large concrete mixer to its equipment. The apparatus will be used in the general contracting business done by the concern.

C. E. Reed has purchased the interests of W. G. Rasch, G. W. Waller and C. W. Diener in the Cement Products Company, of Burlington, and is now sole owner of the concern. Mr. Reed plans to enlarge the plant in many ways.

Plans are being prepared by the city of Wausau for building a large quantity of cement sidewalks during the summer months. The work is to be done by the city laborers and will be charged to the property holders in their taxes.

SPRINGFIELD AND CENTRAL ILLINOIS.

Springfield, Ill., June 20.—With building permits of \$739,000 in the first five months of 1910, in addition to the large contracts at the close of 1909 still unfinished, building conditions in Springfield have a cheering outlook. Consumption of building materials in the thickly settled rural districts is especially good. Concrete on the farm is becoming almost universal in the territory directly tributary to Springfield because of the missionary work done by the Illinois Farmers' Institute. The last of next month is expected to see a large number of big paving contracts well under way. Because the \$100,000 bond issue by the park board is clouded with an election contest the building material trade resulting from this will be delayed. Most of the sum was to have gone for brick and cement work.

Concrete bridges probably will be the rule on the Illinois Traction system, the interurban line which operates over 500 miles of track in Illinois. Within two weeks two trains on the road went through pile trestles.

T. M. Mercer & Son, of Canton, will build the new Y. M. C. A. building in that city for \$23,040.

The Mt. Vernon Press Brick Company, at Mt. Vernon, is building an 85x60 addition to the plant, which will be used for the manufacture of concrete bricks and tile.

The Dahlman Construction Company, of Milwaukee, Wis., has begun work on the erection of the new warehouse for the International Harvester Company at Rock Falls. The building of four stories and basement will be reinforced concrete and will cost approximately \$90,000.

The Ideal Sand Company, of Ottawa, has been incorporated with a capital stock of \$1,000 to mine and ship sand. The incorporators are John L. Johnson, Charles A. Hunsberger and Jessie Johnson.

The Master Builders' Association of Aurora, which will also include the building contractors of Batavia, Geneva, St. Charles and Elgin, has been incorporated. The purpose is to encourage and promote the general interests of contractors. The incorporators are John MacKinnie, Ellis S. Doan and Christ Armbruster. Three trustees elected are John MacKinnie, Nicholas Frisch and Christ Armbruster.

The Frazer Coal Company, of Rock Island, has been incorporated with capital stock of \$2,500 to deal in lime, sand, cement, plaster, brick, stone and tile. The incorporators are E. G. Frazer, Daniel Montgomery and Frank P. Welch.

Frank Fitzsimmons, of this city, has the contract to do the concrete work at the rifle range at Camp Lincoln, Springfield. His bid was \$4,250.

The Collieries Sales Company, of Rock Island, has been incorporated with capital stock of \$20,000 to deal in sand, gravel and general builders' supplies. The incorporators are Morris Gesimer, J. D. Miller and B. D. Miller.

J. C. Adams is now doing all kinds of cement work at Hillsboro, having severed his connection with the Springfield Cement Company.

A. F. Franks, of Jacksonville, will begin work upon a \$70,000 paving contract at Lawrenceville as soon as he finishes the \$75,000 work at Freeport.

R. A. McHenry, of Albion, will build \$3,000 of concrete walks for the village of Albion.

A. D. Thompson, of Peoria, has begun laying the Kieappoo street paving at Lincoln.

City Engineer Frank Payne, of Hoopston, has completed estimates for a \$45,000 sewer system.

The Gund-Graham Company, of Freeport, has the work of laying 30,000 feet of cement walk in Dodgeville, Wis.

John Cherry, of Jacksonville, Ill., landed the \$50,000 Third and Poplar streets paving work at Pana.

The Augusta Brick, Tile and Concrete Company, of Augusta, has the contract for the new Methodist church at Huntville.

The Hollerbach & May Company, of Evansville, Ind., has begun work upon concrete piers for the new Big Four railroad bridge to cross the Wabash river near Mt. Carmel.

Munson Bros., proprietors of the Capron Brick and Tile Company at Capron, report the best season in their history.

Nordella Brothers, of Springfield, will erect the new city hall at Virden.

The Standard Paving Company, of Chicago, secured the West College street asphalt paving contract at Jacksonville for \$17,810.13.

T. J. and H. F. Burk, of Newcastle, Ind., have the contract for the concrete work on seven new bridges near Fithian, Ill.

Because of the increasing business of the cement and tile works at Abingdon, T. F. Young, one of the owners, has sold out his share in the T. F. Young Coal and Lumber Company and will devote his time to the building material industry.

A. C. Crawford and M. E. Dooling, of Virginia, will

do the brick, concrete and plastering work on the D. H. Salzenstein new residence.

George A. Rubin, of Rockford, has sold his half interest in the scrap iron industry in Rockford to his partner and will devote his time to his duties as business manager of the Southern Wisconsin Sand & Gravel Company.

Baird & Collins will open a cement brick and tile factory at Peotone, Ill.

The Granitoid Stone Company, of Urbana, is to build the new Baptist chapel in Urbana of concrete.

The Perryville Gravel & Ballast Company have completed their Chicago & Alton track construction work near Bloomington.

The Western States Fence and Tile Company at Paris expects to have its factory in operation with a full force soon.

The Mississippi Sand Company, of Alton, has bought three new barges for use in the river trade.

Sutton & McCarthy, of Springfield, will lay 24,000 feet of concrete walks in Gillespie.

THE TWIN CITIES.

Minneapolis, Minn., May 18.—There is some anticipation of a shortening up of commercial activities by many people, but if it is coming the building trades are not yet experiencing it. The volume of business represented by the building in the Twin Cities is holding up strongly and is showing steady gains, as a rule, and at the least is maintaining the heavy total of a year ago. What is more to the point is, while there has been an exceedingly heavy amount of small structure work, such as residences and apartments, what business and commercial buildings there are going up are more than commonly of the better class of construction. Concrete construction—reinforced concrete—is holding its own stronger than ever. Some of the largest and most substantial buildings in the Twin Cities are of this form of construction.

The demand for cement is active and keeps the market well sustained in all directions. Prices are firm and tending upward, and stocks are none too plentiful anywhere. There are immense quantities of cement being used in every direction in the Northwest, and for all classes of work, street improvement, sewer work, building construction, railroad work, bridge work, drainage tile work, and the like.

The return of George M. Gillette and W. F. McEwen, of the Minnesota commission on accident liability, has aroused renewed interest in the matter of arranging for protection to industrial workers. The commission visited England, Germany and other countries, investigating their systems of industrial accident payment, and from their observations will form a law to be recommended to the Minnesota legislature, which convenes in January of 1911. The plan is to eliminate the necessity of resorting to the courts to adjudicate what damage shall be due a man who is injured, and thereby save all the money which is wasted in lawyers' fees, court costs and litigation generally.

Minneapolis building permits for May aggregated \$1,836,290, against \$1,533,965 for May of 1909, a gain of about .195 or 19½ per cent for the present season. The total for five months is \$6,585,425, against \$4,366,825 for the same months of last year.

The C. A. P. Turner mushroom system of reinforced concrete construction is being installed in new buildings as follows: The \$100,000 Schwill building, at Memphis, Tenn., a seven-story block; the Y. M. C. A. building at Nashville, Tenn.; the \$165,000 warehouse for the W. S. Nott Company, Minneapolis; the \$180,000 addition to the West Publishing Company building in St. Paul; the Mulvehill warehouse at Denver; the five-story Iten Biscuit Company warehouse at Omaha, to cost \$150,000; the Manchester Biscuit Company's \$50,000 warehouse at Fargo, N. D.; the Merchants' Ice & Cold Storage Company building at Vancouver, B. C.; the seven-story McKenzie building at Brandon, Man.; the McDiarmid building at Winnipeg, Man.; the eight-story Fidelity building, at Duluth, to cost \$125,000; the Young & Witt building, at Duluth, costing \$25,000; and the Jobst Bethard building, at Peoria, Ill.

Work is under way for the Loose-Wiles Biscuit Company warehouse and factory in Minneapolis, at Washington and Seventh Avenues North. This will be a reinforced concrete structure, seven stories high, 147'x110' in size, with brick exterior walls.

Gordon & Ferguson, of St. Paul, manufacturing hatters, gloves, furs and mittens, are securing a site of a block bounded by Third, Fourth, Market and St. Peter Streets, and propose erecting thereon a new wholesale house, of reinforced concrete construction. No plans have been made as yet, but a structure to cost around \$300,000 is proposed.

A recent disastrous fire in the wholesale imple-

ment district of Minneapolis resulted in damaging nearly every building in an entire block. It is expected that several buildings of reinforced concrete construction will be built to replace the destroyed structures, but details have not yet been arranged.

The Leonard Construction Company, of Chicago, has started foundation work for a ten-story extension of the wholesale implement warehouse of the Deere & Webber Company, at 800-818 Washington Avenue North. The extension will be 132'x165', reinforced concrete construction throughout, and will cost \$250,000.

The Minneapolis Transfer and Storage Company is about to start work at Twenty-ninth Street and Hennepin Avenue, on a reinforced concrete warehouse 90'x116', four stories, to cost \$100,000. Downs & Eads are the architects.

Farwell, Ozmun, Kirk & Co., wholesale hardware, St. Paul, have awarded the general contract to Butler Brothers for the erection of a five-story reinforced concrete warehouse, 300'x125', on the block bounded by Fillmore and Fairfield Avenues and Hyde and Water Streets. Cost, \$200,000.

Ellerbe & Round, architects, of St. Paul, have prepared plans for a reinforced concrete addition to St. Mary's Hospital, in Duluth, to cost about \$75,000.

The Dayton Dry Goods Company, of Minneapolis, will erect an extension in the rear of its present building, to cost about \$35,000 more, it being an extension to the extension now under way. The work is of reinforced concrete construction.

The Bailey-Marsh Company, of Minneapolis, has the general contract for an addition to St. Barnabas Hospital, in Minneapolis, at \$48,809. It is of reinforced concrete construction.

The Twin City Rapid Transit Company has started work on the erection of new car barns in South Minneapolis, to be of cement brick and reinforced concrete construction. Cost, \$70,000.

ST. LOUIS.

St. Louis, June 18.—The Terminal Company will erect a station and three viaducts to abolish grade crossings. The viaducts will cost about \$550,000, while the station will cost \$50,000. It will be erected between Biddle and Branch Streets.

The bid of the Bambrick Brothers Construction Company of \$236,650.40 for the contract for the second section of the South Harlem joint sewer was \$25,000 in excess of the estimate of the Board of Public Improvements and an additional appropriation will be asked for.

The Board of Public Improvements will make a recommendation for the passage of an ordinance to authorize a contract for the repairing of the river bank between Baden and Chain of Rocks, where the waterworks conduits are being threatened by the river washing away the west bank. The expense of this work will be at least \$100,000. An effort was made to get the Federal Government to bear a part of the expense, but the report was refused.

The city government contemplates a comprehensive treatment of grade crossings within the city's limits. The cost of this work is estimated at \$8,000,000. Plans have been made by the Board of Public Improvements detailing the proper method of handling each crossing.

David Rankin, Jr., has increased the endowment for the training school which bears his name from \$1,000,000 to \$3,000,000, and some additional buildings are being planned. This school is designed to provide the boys who intend to enter the mechanical trades at a nominal expense with a systematic scientific and manual training supplementary to and perhaps a practical substitute for the usual apprenticeship.

The Murch Brothers' Construction Company have been awarded the contract for the erection of the new Union depot at Memphis, to cost about half a million.

The Board of Public Improvements will probably award the contract for the River Des Peres foul water sewer to the Southern Construction Company, as their bid of \$310,533 was the lowest for this job. In case of the Glaise creek sewer, the George G. Pendergast Construction Company bid \$161,491.75, and this being the lowest bid, they will undoubtedly be awarded this contract.

The Union Sand & Material Company have just received the largest anchor that steamboat men say they have ever seen. It weighs 3,000 pounds, and will be used for anchoring the company's sand barges in the river. The companion (also a new one) to this anchor weighs 2,400 pounds. Trouble was experienced with the smaller ones formerly in use, as they allowed the barges to drift. The new anchors were brought here from New Orleans and were made for sea-going vessels.

KANSAS CITY

A. H. Craney, Jr., has returned from Chicago, where he went to attend the Portland Cement Manufacturers' meeting.

Philip J. Dauernheim, manager of the Glencoe Lime & Cement Company, states trade is fairly good, but would have been larger if the weather of late had been more favorable. This, however, has merely delayed matters and the demand from now on will in consequence be better. The second kiln, in which the new Schmatolla gas producer system is being installed, is being filled and will be working in the course of a week. Their hydrating lime plant is going along and the building will be completed within a month. The Kritzer system has been installed and other material is coming forward.

E. R. Gregg, manager of the Contracting & Supply Company, of St. Louis, says business is quite active. The company turned out last month 20,000 bushels of lime at their plant at Brickey's, on the Frisco railroad. They have four kilns and are reconstructing the plant to bring it up to the best modern conditions.

The Hunkins-Willis Lime & Cement Company state that now the weather conditions are all that could be asked for, business has increased materially and it is taxing their large facilities to make prompt shipments on rail orders and to provide for delivery in case of material wanted for city jobs.

E. W. Savage, of the Acme Cement Plaster Company, says business is keeping along in a steady and satisfactory fashion.

Fred C. Schoenthaler, manager of the Algonite Stone Manufacturing Company, states that the demand for their artificial stone is increasing, particularly in Oklahoma, where building is quite active this season. Their new plant at 3900 Chouteau Avenue is much larger than their old one, and they are thus enabled to take care of a larger volume of business.

The Springfield Crushed Stone Company, of Springfield, Mo., has been incorporated. Capital stock, \$5,000. Incorporators: W. R. Kelso, George F. Knox and Nettie L. Kelso.

The Big Bend Quarry Company, of St. Louis, has been incorporated. Capital stock, \$50,000. Incorporators: John F. Bambrick, Louis Skrainka and Morris Skrainka.

The C. L. Gray Construction Company, of East St. Louis, Ill., certifies to an increase in capital stock from \$750,000 to \$1,500,000. Besides large construction work in St. Louis and vicinity, the company is under contract to erect several residences at Garden City, Long Island.

The Woodland Clay Manufacturing Company, of Woodland, Ill., has been incorporated. Capital stock, \$50,000. Incorporators: John W. Anderson, Jr., William Correll, John W. Anderson and Victor Payson. The company will engage in the manufacture of drain tile, brick, terra cotta, etc.

The Brooks-Mueller Company, of Downer's Grove, Ill., has been incorporated. Capital stock, \$5,000. Incorporators: Thaddeus E. Brooks, Jennie D. Brooks, Fred W. Mueller and Alice Mueller. The company will deal in building materials, fuel and lumber.

The Kremer & Volrol Construction Company, of St. Louis, has been incorporated. Capital stock, \$5,000. Incorporators: August A. Volrol, Daniel H. Kremer, Katherine H. Kremer.

The Republic Brick & Construction Company, of Republic, Mo., has been incorporated. Capital stock, \$10,000. Incorporators: R. L. Derry, William L. O. Bryant and E. H. Britain.

The Plump Brothers' Brick & Tile Company, of Carthage, Mo., certifies to a change of name to the Hamilton Clay Manufacturing Company, and to the change of the principal office from Carthage to Hamilton, Mo. Also certifies to an increase in capital stock from \$20,000 to \$75,000.

EAST SIDE.

The East Side Levee and Sanitary Commission, of East St. Louis, has let the contract for diverting the waters of the Cahokia creek to the S. H. R. Robinson & Sons Contracting Company, of St. Louis, for \$259,152.50. The work will be begun at once and must be completed within the year. A channel four and one-half miles long and about 550 feet wide will be dug. From the 1,427,900 cubic yards of dirt two levees will be thrown up, one on each side of the channel. This is the first step towards building a system of levees to protect the entire East Side from high water. A concrete wall will also be constructed along the river front of East St. Louis, with six openings, so that teams can pass through to the Wiggins' Ferry landings.

The Terminal Railroad Company has completed the plans for the enlargement of the Madison freight yards. The capacity of this classification yard is to be increased from 800 to 3,200 cars.

Kansas City, Mo., June 20.—Building operations have been continuing steadily during the past month in this city, in spite of the fact that there have been some indications that a let-up may be expected. A great majority of the larger buildings of this city are built partially upon borrowed capital, and this capital seems to be getting a little shy of late. It is stated by well-known builders that where it was formerly easy for them to borrow 60 per cent of the value of the proposed building on a first mortgage, it is not now easy to borrow over 40 per cent. The only reason advanced for this change in conditions is the claim that the money market is a great deal tighter and that money is scarcer of late. At any rate, the condition exists, and a good many buildings which have already been planned are being held up for lack of sufficient capital to complete them. Men who have been accustomed to receive loans of 60 per cent gauged their proposed buildings according to their own capital, figuring that they would raise the 40 per cent, and when the size of the loan could not be made large enough it became necessary to change the plans or wait until there was a loosening up on the part of the money lenders. Some are adopting one plan and some the other, but the result is a cutting down of the work of the future to a considerable extent from the expectations of a few months ago. Up to the present time this does not seem to have cut much figure in building activity. Buildings already under course of construction are being rapidly completed, and the hundreds of buildings which are being entirely built by Kansas City capital, or western capital, are still going up. There does not seem to be as much trouble in getting western capital to invest here upon reasonable terms; in fact, western men are coming here and making large investments of their own, besides furnishing capital in many instances for others to invest in buildings. There has never been a time in the history of the city when real estate sales were as large as they have been this year, and real estate men declare that there is much more business in the air.

Lime and cement dealers are reporting rather a dull business in the country, dealers in the smaller places evidently not having very heavy sales. This is largely attributed to the fact that nothing in the building line is now being done on the farms, and the business of the small towns is confined to the buildings in the towns themselves.

Crop prospects are good.

There is a constant improvement noticed in the demand for hydrated lime, the orders, even from the smaller cities, containing a greater proportion of hydrated lime in each car. The first trouble is in getting someone to give it a good, fair trial, handling it according to directions, and then the handler is a friend of hydrate from that time. Some trouble is experienced with men who know too much to follow the directions, however, and this is the only trouble ever reported. Some men know more about how a material should be handled than the manufacturer, and it is this class which turns down hydrated lime as worthless.

John T. Smith, business agent for the Building Trades Union, is authority for the statement that there will be plenty of building mechanics in Kansas City this year to take care of all work in sight. He says that workmen come here from outside points every summer, knowing that there is always plenty of work for good men.

Four new office buildings are to be erected within a block on Grand Avenue, and one is already nearing completion in the same block.

The Cyphers Incubator Company, of Buffalo, N. Y., has leased a tract of land on the southwest corner of Twenty-fourth and Penn Streets, and will erect a four-story brick and concrete warehouse thereon.

Plans are being drawn for P. O. Rose for a hotel building 60'x126', eight stories high, which he is to build at 916-18 Oak Street. It will be of brick and reinforced concrete and is to be fireproof.

The Chanute Cement Company has been incorporated with a capital stock of \$1,000,000 and has taken over the plant of the Chanute Cement & Clay Products Company, in Chanute, Kan. This company was formed by reorganizing the stockholders of the old company, and will go ahead and operate the plant, completing one unit for the present, as their capital was large enough to pay for the plant when it was sold and to put in the one unit. The officers of the company are: Milo T. Jones, president; Charles T. Beatty, vice-president and general manager; A. N. Allen, secretary and treasurer. The directors are C. T. Beatty, A. N. Allen and Milo T. Jones, of Chanute, Kan.; A. A. McClanahan, of Chicago; V. C. Bantzahn, of Mansfield, O., and Francis Sieberling, of Akron, O.

The University of Kansas is to issue a bulletin this summer giving the result of tests made of the various stones of the state for road-building purposes. More than 200 samples have been tested.

Brown Brothers, of 240 North Sixteenth Street, Kansas City, Kan., have been awarded the contract to erect a concrete culvert for the Kaw drainage board, at \$11.69 a cubic yard. The culvert will cost about \$12,000.

W. B. Strang, of the Missouri & Kansas Interurban Railway Company, states that there will be an interurban union depot built here which will cost \$2,000,000.

The new building which is to be erected here by the National Biscuit Company, on Central Street near the Southwest Boulevard, is to be 33'x151', seven stories high and thoroughly fireproof.

The Ash Grove Lime & Portland Cement Company is contemplating some important improvements to its cement plant, but plans are not yet far enough along to talk about them.

The United States Gypsum Company, which has been maintaining an office in the Long building for its traveling men in this territory, has now opened a suite of offices in that building and will maintain a regular office force with a sales department here. F. W. Farrington will continue to have charge of the Southwestern territory, which will be under the jurisdiction of this sales office, and the office itself will be in charge of W. P. Carver.

THE WEST COAST

San Francisco, Cal., June 8.—Continued improvement is noted in the building situation in San Francisco, the valuation of buildings for which permits were issued in May being \$2,447,067, a fair increase over the previous month, though still below the same month in the last few years. The situation appears to be about normal, the extraordinary activity having subsided. Some of those who prepared to meet the extraordinary demand for buildings are a little disappointed, but from now on a gradual increase is expected with the natural growth of the city. No records were broken at any of the coast points last month, but throughout the entire country the amount of building is very good as compared with last summer.

The buildings now going up in San Francisco are for the most part small, and concrete remains a favorite material, though the present cheapness of brick brings the latter material into greater use than if the price could be maintained. The majority of building here is now of a permanent nature, fireproof materials being used for most of the new apartments, etc. Public buildings will probably require a good deal of concrete work in the next few months, and more large contracts are being placed for the San Francisco seawall, bulkheads, etc., which are built mostly of concrete and crushed rock. The Healy-Tibbets Construction Company is now actively at work on its large down-town sewer contract, and similar work is being done in several other parts of the city. Two large tunnel projects are being talked of, which if carried out would require a lot of concrete construction. Paving is rather quiet here, but is extremely active in the north, and shipments of both cement and asphalt in that direction are heavier than ever before.

It is expected that several changes of moderate importance will be made in the California cement plants during the summer, with a view rather to greater economy than increased output. The demand for cement in the market immediately tributary to San Francisco is good, but hardly up to expectations, and the annual output of California plants now exceeds the market requirements. A good outlet for the surplus is found up and down the coast, but the prices received for the material shipped out are not usually very attractive. Cement prices in San Francisco and surrounding territory are steadily maintained, an advance of 10 cents per barrel having been made June 1. The leading manufacturers state that cement is not being bought for many large projects at present, the demand being general and well distributed throughout the country. The prosperity of the agricultural districts is enabling many farmers in the irrigation belts to put in permanent improvements, such as concrete "boxes," which eliminate the excessive waste of water which the use of wooden "boxes" involved, and are impervious alike to the attacks of decay and of rodents.

The Holmes Lime Company recently reopened its kilns at Felton, Cal., and is now supplying the plastering trade with large quantities of its staple brand, "Diamond" lime, which has stood the test for years and is recognized as one of the best plastering limes on the coast today. The company reports a continued active demand for hydrated

lime for building purposes, especially for the water-proofing of concrete. It is also used extensively for brick mortar on jobs that require rapid construction.

Hydrated lime is also in good demand for the dust spray, introduced last year for orchard use. The dust method of spraying has gained popularity this season, and California fruit growers are spraying more systematically this year than ever before, thereby reducing the damage of fruit pests to a minimum.

The lone fire brick and fire clay sold by the Holmes Lime Company have been in very active demand for the last six months, and sales so far this year have been more than double those of last year.

The installation of the stone crushing machinery for the Yosemite Stone Company at Exchequer, in Mariposa county, California, is progressing rapidly under the direction of E. N. Greenleaf, the engineer in charge. When completed the plant will be among the largest on the coast. The heaviest piece of machinery will be a No. 8 Gates crusher, weighing over sixty-five tons. A locomotive crane, with ten-ton capacity, has been built for the company by the Union Iron Works, of San Francisco. The Exchequer Mining & Power Company is increasing the capacity of its hydro-electric plant to furnish power for the crusher.

The city of Oakland, Cal., is in the market for a gyratory crusher for the use of the street department. A number of macadamizing and asphalt paving contracts are likely to be let in Oakland before long. The city engineer is carrying on experiments with oil macadam, which is now used on all streets not requiring asphalt, with a view to finding the most efficient specifications.

Both Standard and Santa Cruz mills of the Standard Portland Cement Company are running at their usual capacity, and the output finds a ready market in various parts of the coast. A contract has been made with the Lyons Gypsum Company at King City, Cal., to supply the Santa Cruz mill with 8,000 tons of gypsum annually for the next five years.

Work is to be started shortly under the direction of the San Francisco park commission on the first section of concrete wall and road along the ocean. When completed the wall and road will extend several miles along the beach from the Cliff House to the Lake Merced Rancho.

The California Rock Asphalt Company has been incorporated at Fresno, Cal., with a capital stock of \$22,500, by F. Bader, W. H. Worswick, Jr., A. C. Ruschaupt, A. C. Howard and W. Morley.

The California Steel-Monolithic Company has been incorporated in San Francisco, with a capital stock of \$1,000,000, by William Mooser, E. C. Leflingwell, H. G. Vaughan and H. I. Kowalsky.

The Ransome Concrete Machinery Company has removed its main offices in San Francisco from the Crocker building to the new Mechanics' Institute building, 57 Post Street.

Timothy Mahoney, who controls large deposits of gypsum near Fillmore, Cal., is organizing a corporation to erect a plaster mill at that place.

The Shasta Lime Products Company has been incorporated at San Francisco, with a capital stock of \$50,000, by E. E. Mead, C. B. Morgan, E. H. Nuremberg, R. C. Ward and F. R. Turton.

The Cement Products Company, of Los Angeles, has secured a location for a factory in that city and will start immediately.

The Riverside Portland Cement Company, of Riverside, Cal., has taken a contract for 225,000 barrels of cement to be shipped to the Portland Railway, Light & Power Company at Portland, Ore., for use in its new power development projects. The cement company is planning to put considerable new machinery into its plant, to increase the output from 3,000 to 4,500 barrels a day.

The California Harbor Commission has taken bids on Section 10 of the new San Francisco seawall, to be built of rock, steel and concrete.

The coast steamers carrying lumber from northern ports have of late built up a profitable traffic in transporting cement and asphalt from San Francisco and southern California ports to Portland, Seattle and Tacoma. The Ocean Barge & Tugboat Company, recently organized to take care of this traffic, has bought a barge and chartered a tug, the first trip having been made last month. The intention is to carry lumber and grain on the return trips. It is reported that the company has closed contracts for the transportation of all the cement sent north by companies having headquarters in San Francisco.

A project has been started at Long Beach, Cal., to build a walk and bulkhead which will require 8,500 barrels of cement and 6,500 cubic yards of crushed stone and sand.

The Fair Oaks Fruit Company is preparing to build a concrete olive oil mill at Fair Oaks, Cal.

The Balfour-Guthrie interests are planning to erect a concrete flour mill at Portland, Ore., which will be one of the largest mills in that city.

At the annual meeting of the Southwestern Portland Cement Company, at El Paso, Texas, last month, Carl Leonhardt, of Los Angeles, was elected president; C. C. Morrill, vice-president; A. Moore, I. H. Hellman and J. S. Schirm, all of Los Angeles, directors.

BIRMINGHAM.

Birmingham, Ala., June 18.—Although with the arrival of warm weather business is not all that could be desired, still there is a good deal of activity in the building material market. The cause of this semi-dullness is very apparent to the close observer. It is a well-known fact that Birmingham, and in fact the entire district surrounding it, is dependent for its financial prosperity on the market price of the vast mineral deposits that lie in and about its confines. Only a few months ago the price of iron was \$14, but now it has fallen to the small sum of \$10. This has a very marked effect upon this district, for the many furnaces and mines shutting down throw a large number of people out of employment. The majority of dealers are dependent for the greater part of their trade not so much upon the large companies and corporations but upon the small builder, and it may be plainly seen from the above statements that in view of the present conditions the small builder is the very person who ceases his operations, thereby causing a diminution in the sales of the trader.

The Birmingham Sand & Brick Company reports fair business.

According to the statements of the Birmingham Supply Company, Vulcanite roofing is still leading the market. The roofing of the plant of the Central Manufacturing Company, of Gadsden, is especially worthy of mention among the different jobs done during the month.

Work will soon start on the erection of the Fraternal Hall by the Odd Fellows and Knights of Pythias lodges of Birmingham on Third Avenue and Twenty-second Street. The plans drawn by Architect Harry B. Wheelock have been accepted and the contract will soon be let. The building will be four stories high, and will be modeled after the most modern and approved style of fraternal buildings.

The Jefferson County Building Material Men's Exchange held its regular June meeting on the second Thursday of the month. W. A. Currie was in the chair and Secretary Thomas Forbes at his desk. A number of new members were added.

The General Building Contractors' Association has changed its meeting day from Saturday to Monday. This association is composed of a number of the leading contractors of Birmingham.

Much interest is being manifested at the present time among the dealers in building materials in the race for the office of street commissioner of Birmingham. Since the annexation of the suburbs to the city this office has become one of great importance, and the race for this prize is very spirited. Among the candidates for this office are W. D. Simms, D. L. Brown, J. R. Keeling, H. H. Huffstutler, W. H. Pregel, J. E. Harrington and several other gentlemen known in the contracting world.

The Southern Bithulitic Company has come back to Birmingham after a short stay in Meriden, Miss. This company recently captured the contract for the paving of the Second and Third wards, amounting to the sum of \$85,000.

The city council has advertised for bids for the paving of Thirteenth Avenue South.

The combined capitalization of the present and prospective cement manufacturing industries of the Birmingham district closely approximate two and a half million dollars. The output amounts to more than 1,000,000 barrels annually, and employment for 2,500 men is furnished. Two plants are now in operation, one is nearing completion and two are prospective. The largest plant now in operation will soon double its capacity.

The two plants now engaged in the manufacture of cement in the Birmingham district are those of the Standard Portland Cement Company, at Leeds, and the Southern Cement Company, at North Birmingham. The former manufactures Portland, while the latter is engaged in the making of hydraulic cement. The plant under construction is that of the Atlantic & Gulf Portland Cement Company, at Ragland, Ala. It is also reported from authentic sources that the Atlas Portland Cement Company will erect a large plant at Montevallo, Ala., and that the Universal Portland Cement Company will build at Calera, Ala.

Announcement has reached your correspondent to the effect that a \$100,000 shale brick plant will be erected in the near future at Leeds, Ala.

J. B. Copeland, of the Copeland Brick Company, has secured for his firm a contract calling for about 20,000 yards of brick paving in Jackson, Miss.

At a special meeting of the Board of Education the contract for the erection of the J. B. Cunningham school at East Birmingham was awarded to T. L. Medders & Co. The new structure will cost \$53,200, and will be three stories high, containing 30 rooms.

Mr. Walker, of the Carolina Portland Cement Company, said the following in an interview with your correspondent: "Although the business of the corresponding period of last year was greater, still there is no cause for complaint, as there is every prospect of a renewal of activities. Among our large contracts worthy of mention are the sale of 4,500 barrels of cement to the Woodward Iron Company, at Woodward, Ala., and the purchase by the Corey Land Company of 200 cars of sand."

One of the most stupendous efforts ever made is the erection of a new city in the vicinity of Birmingham, to be named Corey, by the Jemison Real Estate Company. Contracts for street construction already amount to the sum of \$500,000, and more are to come. A noticeable feature is the fact that all of the contracts were secured by local companies. Among the successful firms may be mentioned the Southern Bithulitic Company, Dunne & Lallande Brothers, Copeland Brick Company, Graves-Mathews Paving Company and the Sullivan & Long Company.

LOUISVILLE.

Louisville, Ky., June 15.—Conditions in the building and allied trades are so much improved over what they were a month ago, that one is justified in saying that pessimists have been converted into optimists. Although there are a good many large building projects in view, the builders are not depending upon them so much as on the volume of small work which is actually being handled. The big fellows will undoubtedly help things a lot, but as they are slow in coming, the members of the trade are glad to see the smaller jobs under way. The contract for the Tyler Hotel has been let to L. P. Hazen & Co., but for some reason construction has not yet begun. The First Christian Church will be begun as soon as the contracts can be let, and Architects McDonald & Dodd are preparing to send out specifications now. The same firm is working on plans for the big annex to the Weissinger-Gaulbert apartment house; while John Bacon Hutchings, who is in charge of plans for the fifteen-story office building to be erected at Fifth and Jefferson Streets by the Caldwell estate, has not reported any definite developments.

Nevertheless, a good many propositions are actually under way, these including the Business Woman's Club building, a new building being erected for the local plant of the Standard Sanitary Manufacturing Company, and the Snead power plant. These are keeping things moving for the supply and material men. The number of handsome residences going up is the most encouraging feature of the situation, however, and it is declared by architects that Louisville people are planning to put a larger part of their money into fine homes, for which the city is already famous, than ever before in its history.

The cement and concrete men are very cheerful over their part of the business. It has been found that the demand today is for concrete foundations, concrete porches and concrete walks, so that no matter what the type of construction is, there is always a job somewhere on it for the concrete contractor. Several of the largest jobs local firms are working on at present are concrete porch jobs, the big, roomy, cool veranda having apparently come to Louisville to stay.

The increasing strength of the cement market, which was noted last month, has not suffered a reaction, but, on the contrary, is continuing to develop. Dealers report that while no extraordinarily large sales have been made, the volume of business is larger than for several years, and that the only unpleasant feature of the situation is that manufacturers are not making standing quotations, but are reserving the right to accept business subject to approval.

Business is being booked for immediate deliveries, the manufacturers intimating that advances are to be made rapidly. There seems to be a well-defined impression that if the present heavy demand for cement continues the price will be as good as it was in 1907. Of course it is still far from that point now, but it is much higher than it was last season. There are no large stocks of cement anywhere to be found, as far as can be learned, and with the mills running at top speed to supply the needs of the country, there is no reason why the price should remain stationary.

The sewer pipe makers are cheerful over the situation, local business having been added to by orders from all parts of the South. It looks as if the southern states have had a sanitary revival, for an unusually large amount of sewer work is being done. The manufacturers of vitrified brick also report large sales to municipalities. Lime and wall plaster are selling better than a few weeks ago, and roofing supply dealers report increased business. Altogether the situation is one over which it is easy to enthuse.

John L. Wheat, of the Union Cement & Lime Company, who is one of the oldest members of the trade here, but who stays "on the job" about as well as the young fellows, said that business with his company is fine, with sales large and prospects for an active summer good. Prices are advancing right along, he said. Lime sales for this year have been much greater than for the same period of 1909.

Henry S. Gray, of J. B. Speed & Co., was out chasing the butterflies off the golf links when the correspondent of Rock Products dropped in. Mr. Gray's physician has advised him to get more exercise, and he has taken up golf as his principal avocation. Members of the company reported conditions better, with the mill running to its capacity and the prices showing consistent improvement. The demand is absorbing practically the entire output of the mill.

Webster Gazlay, of the National Concrete Construction Company, said that a good deal of concrete work is being figured on, and that his company is busy with jobs for which contracts were announced some time ago. One of the most interesting pieces of work this company has done recently is the reinforced concrete sawmill of the Richland Parish Lumber Company, which is controlled by the Mengel interests. It is said to be the only one of its kind in the South, and its construction was particularly heavy because of the fact that much of the machinery is of the kind which starts and stops quickly, subjecting the structure to considerable vibratory shocks. The Mengels are enthusiastic over the building, which was designed by the National. Mr. Gazlay looks for a good season in the concrete line.

The Central Concrete Construction Company said that while things have slackened up a little compared with the situation a month ago, they are still fairly busy. They are doing a lot of work on concrete porches, this sort of work forming a larger and larger proportion of the business. The company has just completed the concrete wall around Cave Hill Cemetery, one of the largest jobs of the kind handled here in a long while.

The Culley Cement Block Company has moved into its new factory building at Brook and Lee Streets and is turning out a large volume of blocks. During May sales were 5,000 larger than a year before. The company has all it can do, and is looking forward to making extensions as the business develops. A switch has been put in at the new plant and the company is receiving all its material in car lots at present. The machinery trade is a little quiet with it just now.

Sam Robertson, the local concrete man, is at Gethsemane, in Nelson county, handling some important concrete work for the monastery there. A fire made replacements necessary, and the order having charge of the place showed that it had become acquainted with the modern idea by having concrete used in the work.

The National Roofing & Supply Company is busier now than in some time, the warm weather having brought out a good deal of business. Foundation work is forming the principal part of the business, Mr. Streicher said, practically every residence which is going up calling for foundations of concrete. Most of the supply lines are quiet just now.

The Ohio River Sand Company is progressing in the work on its new office building and hopes to move in some time next month. The demand for sand is fair, the sewers still taking a good supply, and the two diggers which are in commission are producing a big lot which is being held in anticipation of heavy building this summer.

The Kentucky Unit Brick & Tile Company, which manufactures a concrete brick by the "wet" process, is having good success in introducing this article, which is unusual. The brick is made in the shape of a "U." Contractors are taking to it readily.

Thomas Bishop, of the Southern Brick & Tile Company, said that while local business is a little quiet, the shipping end of the trade is good, building out in the state apparently having started in larger volume than usual. The sand-molded face brick which the company is making is proving popular, Mr. Bishop said.

The Kentucky Wall Plaster Company reported the situation improving, things having been a little quiet for a few weeks. Building is now getting to the stage where wall plaster is needed, however, so the company's product is in much better demand than formerly. The experiment of exposing the plaster to the weather in the form of stucco, which is being tried out on the company's office building, has not yet been terminated.

The P. Bannon Sewer Pipe Company is very busy on account of the sewer work of the city, which is taking a lot of material. Both the municipality and the Sewerage Commission are building lateral sewers which are requiring pipe; while out in the state many of the smaller cities are planning sewer systems which are expected to require a large volume of material.

The Kentucky Vitrified Brick Company is selling a large amount of paving block, Louisville as well as other surrounding cities having planned much street construction work this season. The plant is running to its capacity.

L. W. Hancock & Co., general contractors, have filed articles of incorporation with the county clerk. The capital stock of the concern is \$10,000.

The new mechanics' lien law of the state has gone into effect. It provides a change of the utmost importance to material men, to the effect that in order to exercise the lien immediate service must be made following the delivery of the material. It is likely that the building supply men will be careful as to the credit of those to whom they sell hereafter. The Builders' Exchange has facilitated the progress of work by sending out forms upon which necessary facts may be recorded, and this has proved a convenience for both contractors and supply dealers.

Mike Switow has purchased property and will erect a \$50,000 theater and business block in New Albany, Ind.

Building statistics for the first five months of 1910 show a healthy gain over the corresponding period of last year. They represent an expenditure of \$1,521,000, compared with \$1,108,000 for five months last year, showing an increase of nearly 50 per cent.

The junior class of the Male High School, of Louisville, according to its custom, paid a visit recently to the plant of J. B. Speed & Co. and inspected the manufacture of cement from the rock to the sack.

The building inspector has issued a booklet summarizing the new tenement house law passed at the last session of the Legislature. Contractors are preparing to obey its provisions to the letter.

The street railway has announced that it will extend one of its suburban lines so as to connect with Kosmosdale. This will be a big convenience to the people of the town, most of whom are employed in the plant of the Kosmos Portland Cement Company.

Frank May was awarded a contract for the construction of a sewer system at Hartford, Ky. It will cost \$13,000.

Jacob Bornstein, the local contractor, will erect a business house at Fifth and Walnut Streets, having secured a 99-year lease on the property. It will cost \$60,000. Mr. Bornstein has secured the contract for a church building at Shelbyville, which will cost \$30,000.

The First National Bank, of Paducah, has let a contract to the St. Louis Construction Company for a new building to cost \$75,000. Work has already begun.

The local chapter of the American Institute of Architects is planning to adopt the system of charges recommended by the Institute, and will charge clients 6 instead of 5 per cent, as heretofore. The latter is held to be insufficiently remunerative.

MEMPHIS AND THE SOUTHWEST.

Memphis, Tenn., June 18.—The past few days have developed some good prospects for the Memphis building supply trade and not a few little changes in the market. The July outlook is good and everything points to a good season through the summer and fall.

The Russell Uniform Stave Company, of which P. D. Clack is manager, is building a large reinforced concrete factory building here for its stave plant. The same will be completed in August.

The Fischer Lime & Cement Company put a new warehouse into commission for its use on Central avenue a few weeks ago. This company supplied all the cement, wall plaster, etc., being used in the Cotton Exchange skyscraper at Memphis and also furnished the plaster used on the Central Bank & Trust Company building. It is also furnishing cement for use in the culverts at Union Station. The

company has taken the agency for plaster board Insulite.

The Fischer Lime & Cement Company will build a new warehouse for its own use along the Southern tracks and perhaps give up the present location in the near future.

The Memphis cement market has stiffened up about 30 cents within the last ninety days, making the price about \$1.90 net now.

H. P. Johnson, of the Union Sand & Material Company, Tennessee Trust building, left on May 15 on a European tour. His was a motor car party. The Memphis office of this company reports an improved trade in sand and cement following the recent heavy rains.

The DeSoto Gravel Company here, of which A. C. Gillespie is president, is doing considerable work on the Pigeon Roost road in Shelby county and with no rejections.

J. N. Falls and associates will erect a twelve story concrete fireproof cotton office building, in which will be gathered factors and brokers in the cotton trade. The cost of the building will be \$350,000. It will stand on North Front Street at Nos. 24 and 26. C. Hunter Raine and Joseph Newburger are among those promoting the building.

The contract will be let next week by County Chairman J. F. Williams for a concrete tuberculosis ward at the county workhouse.

Murch Brothers have been given the contract, says a Louisville dispatch, for the new Union depot main building.

J. C. Lovelace, of John A. Dener's Sons Company, is in Chicago on a little business trip.

The following is a list of the recent installations which The Cyclone Drill Company, of Orrville, O., have made of blast hole drills among the quarry and railroad contractors: Marblehead Lime Company, Kelley Island Lime & Transport Company, U. S. Crushed Stone Company, Kokomo Stone Company, Lathrop & Shea, Mercer Stone Company, Empire Stone Company, Moorman Brothers Company, Winston Brothers, A. B. Cook & Co., Union Lime Company, John B. Carter Company.

Seventeen machines were installed for the above companies.

The splendid results being obtained from the use of Cyclone drills on blast hole work has made this class of drills one of the most important of any branch of their business.

The various quarry companies who have installed drills of the well driller type are effecting a great saving over the previous methods of drilling and shooting.

"Silicate Brick Machinery" is the title of a book recently issued by the Wiebe Engineering Company, of New York City, and the engineers, designers and builders of factories for the manufacture of all classes of silicate bricks. In the "Foreword" they have to say: "All experiment in the sand lime brick industry, of whatever date, is now ancient history. The Wiebe Engineering Company has solved every difficulty in the process, and is now in a position to construct new plants or reconstruct old ones and guarantee their operation on a safe, sound and profitable business basis. In order to do this we have selected the best machines in existence adapted to the purpose, and wherever machines could not be found to perfectly perform any particular function in the process we have designed and perfected machines of our own. We have embraced in this catalogue a plain, concise, detailed statement of the process of manufacturing perfect sand lime brick and ask your attentive and earnest consideration of the same, as well as of the machinery specified for it."

The booklet goes into the subject of manufacturing these materials in a very thorough manner and should prove interesting to any manufacturer of silicate brick. It is beautifully illustrated and very comprehensive in its character. The Wiebe Engineering Company will be pleased to mail one of these booklets to any one interested.

In good brick work—granting that the brick themselves are of the most perfect type—no feature is more essential than fresh and clean-cut appearing mortar joints. Mortar that grows shabby and fades will destroy the beauty of the finest architectural creation. This fact is but one of many, equally important, which the owners of the Ricketson Mineral Paint Works, Milwaukee, Wis., have borne in mind during the twenty years of their manufacturing experience. Not alone in brick work, but for cement work of all kinds, their colors have demonstrated the fact that they absolutely make the cement close and waterproof, and what is more, their guarantee is, "They never fade."

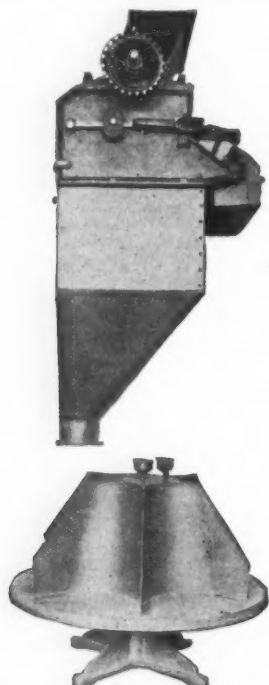
Side Talk

We print an illustration of an improved and automatic weighing machine to weigh crushed and pulverized limestone, lime, cement and similar fine materials into bags, which is finding favor wherever introduced.

This machine is known as the Richardson Automatic Bagging Scale.

It may be built in any capacity, but the standard machine is of 100-pound capacity and is capable of weighing from four to six bags of 100 pounds each per minute, according to requirements.

The machine is built on a principle which ensures for it great accuracy and length of life. It has what is known as an equal armed weigh beam which supports at equal distances from the fulcrum a closed and sealed weight box in which standard test weights are placed for the quantity it is required to weigh, and a



RICHARDSON AUTOMATIC BAGGING SCALE.

weigh hopper in which the material is weighed. These two receptacles are arranged in weight so as to balance each other when empty, and when properly adjusted the same exact balance is secured on every weighing when the weight receptacle is loaded with weights, and the hopper with material.

The supply is admitted to the weigh hopper from a feed chute in which a very novel and effective feeding device revolves and ensures an even feed. This feed chute is controlled by an under-cut gate, which automatically cuts off the supply at the proper moment. When the desired quantity has entered the weigh hopper, the beam balances and this can be discharged by the operator pulling a chain, or it may be set to work automatically, if required.

The contents are deposited through a guiding hopper or sacking spout into the sack. This sacking spout has suitable air vents, and is of such construction that it is absolutely impossible for material to adhere to the sides, and so cause an inaccurate discharge.

The scale proper has solid frames and is absolutely enclosed, so that the dust cannot escape. This construction makes it very easy on the operator, as the dust is kept inside and enables him to do his work better and faster.

Immediately underneath the sacking spout a revolving table is usually arranged, which is furnished complete with the scale. This is adjustable, working on a screw, the adjustment being according to the height of the bags. This turntable has six sections, so that it can hold six bags.

The mouth of the empty bag is placed on the sack spout, the bottom of the bag resting in one of the sections on the table. When this is filled the operator moves the table around and puts another empty bag

on the spout, and so on. Inasmuch as this table has a capacity of six bags, it so happens that each bag is on the table a period of one minute, and this in weighing cement and similar volatile materials allows the cement to settle in the bag to a very appreciable degree, so that the tier at the back can at once tie the bag without lifting or shaking it in any way.

It will be seen that there is no lifting of the filled bag by the scale operator, as the bag rests upon the table. The only work of the tier is to draw the mouth of the sack together and slip the string over it, and remove the filled sack from the table. Inasmuch as there is no necessity for much lifting of the filled bag or shaking of it to get the material to settle, this arrangement is very easy on the operator, and in practice it is found that one man at the scale and one man tying on the table can easily take care of four bags per minute continuously. The turntable is of very strong construction, and is fitted with grease cups to force out grit from the bearings.

The accuracy of the scale is exceedingly close. The cut illustrates the scale complete with a revolving table.

The machine is manufactured by the Richardson Scale Company, whose works are at Passaic, N. J., and who have offices at 3 Park Row, New York, and 122 Monroe street, Chicago.

The Alpha Portland Cement Company, of Easton, Pa., recently issued a magnificent brochure entitled "Alpha Portland Cement for Eternity," which is by far the handsomest piece of advertising that has ever been issued on the subject of cement. In the introductory they say: "In placing this book before you, our aim has been the compilation of concise, authentic information on Portland cement for the convenience of architects, engineers, contractors, dealers and all who may have occasion to explain the advantages and uses of Portland cement in popular language. Much literature on this subject has been published for the expert, hardly any for the home owner who scarcely realizes the great utility of this, the most adaptable of all building materials for economical construction and improvements. These pages also show the widespread use of Alpha Portland cement by the foremost architects, engineers and contractors."

It goes into the subject very extensively and in addition to being a magnificent creation from a typographical and artistic standpoint contains information alike valuable to the small and the large user of cement. The illustrations are beautifully etched half-tones printed on tinted backgrounds, which bring out their fine points. It contains chapters on the following subjects: Portland Cement, Aggregates or Other Materials, Proportioning, Water, Mixing, Forms of Concrete Construction, Atmospheric Influences, Sidewalks and Pavements, Concrete Surfaces, Reinforced Concrete, Fireproofing, Concrete Blocks, Waterproofing, Sea Water Construction, Suggestions to Home Owner, Partial List of Uses, Definitions and Standard Specifications.

The American Pulverizer Company, St. Louis, Mo., are manufacturing a screen which they claim has a much greater screening capacity than others. The American Piano-Wire Screen is, as shown in the accompanying illustration, composed of a heavy cold drawn steel shaft, which is continuous throughout and insures perfect alignment, rigidity and easy running. The wire carrying frame is composed of steel discs held in place and supported by hollow tubing, which is connected with a central shaft at either end. Imported steel music wires are used for the screening surface. The wires are looped over steel pins at the discharge end and coiled around threaded pins to make them taut at the feed end. These pins are screwed into laminated wood, which firmly holds them, the same as they are held in an expensive piano. Each wire is spaced and held taut independent of adjacent wires, making

it possible to adjust the size of screening and to replace any wire without disturbing the others. The discs hold the wires firmly, and spacing these discs every two feet prevents them from spreading. By the use of these wires the screening surface is increased 200 per cent to 300 per cent, eliminates the necessity for high screening towers, and does not take up as much space as the ordinary screen. It is capable of handling any screenable material.

About three years ago William Emsweller, Jr., of New Salem, Ind., purchased a portable Symons Gyrotory No. 5.

About six months after Messrs. Low & Craig, of Rushville, Ind., inspected this crusher and bought a similar outfit.

Messrs. Reed & Thompson, of Greensburg, saw the crusher furnished to Low & Craig, and bought a portable No. 5.

W. A. Fisher, also of Greensburg, inspected the two last named crushing plants and bought a Symons No. 4.

Acquaintance with the above named crushers induced Wm. Avery, near Greensburg, to buy the Symons mounted No. 5.

The Statler Stone Co., of Piqua, Ohio, telephoned to several of the above named parties and to other neighboring references—then bought a Symons No. 7½.

The National Lime & Stone Co., of Grants, Ohio, sent a representative to spend one day at Greensburg, inspecting these crushers. They bought next day a mounted No. 5 for road work.

The Marengo Stone Co., of Marengo, Ind., sent a representative to Greensburg and purchased a Symons No. 7½, together with additional crushing equipment for a large stationary plant now in operation at Marengo, Ind.

Upon receiving reports from the last named plant, and inspecting a few of the above named crushers, Henry Bickel, one of the best known contractors in Louisville, bought one of our No. 5s.

W. F. Woodruff, of Louisville, having seen the Bickel crusher, bought one like it.

Adams & McClusky, of Louisville, having seen the two Louisville crushers, bought a Symons No. 5 machine for their own use.

The city of Louisville is just installing a No. 5 Symons crusher, the purchasing committee having conferred with the Louisville contractors.

Messrs. Holloran & Haverstick, at Aurora, Ind., owing to reports from above named machines, bought a mounted No. 4.

Not another gyrotory crusher of any kind has been sold in the city of Louisville or neighboring locality within the past twelve months.

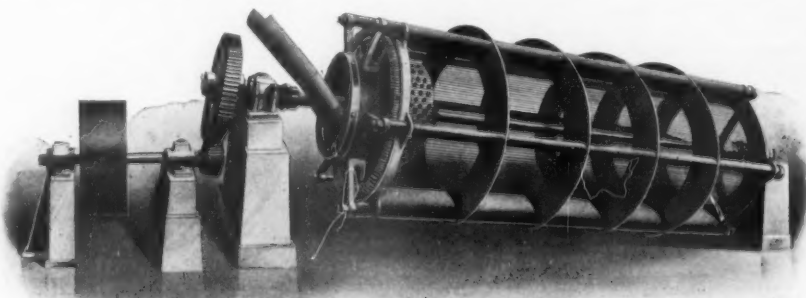
This growing chain of Symons crushers is open to investigation at any point, and constitutes an invincible argument as to whether the Symons crushers are appreciated where the facts regarding them become thoroughly known.

For further particulars address the T. L. Smith Company, 305 Old Colony Building, Chicago.

George W. DeSmet, 419, 140 Washington Street, Chicago, Ill., has recently secured control for this territory of the famous "Whitestone Granito," which makes the most beautiful Terrazzo or Venetian flooring, absolutely stainless, durable and economical.

Wherever this flooring has been used, perfect satisfaction has always been the result. It is indorsed by the leading architects all over the country. It has been used extensively all over the South and West, and now the North and East are adopting it.

We give herewith a few of the buildings in which "Whitestone Granito" has been used: Harrington Hospital, Buffalo, N. Y.; American Safe Deposit Company's building, Pensacola, Fla.; Government



THE AMERICAN PIANO WIRE SCREEN.

Postoffice, Macon, Ga.; Presbyterian Hospital, Atlanta; Masonic Temple, Greenwood, S. C.; New Union Station, Chattanooga, Tenn.; Y. M. C. A. Building, Memphis, Tenn.; New Masonic Temple, Jacksonville, Fla.; Charlotte Realty & Trust Company Building, Charlotte, N. C.; Masonic Temple, Atlanta, Ga.; Agricultural Hall, Iowa State College, Ames, Iowa; St. Joseph Orphan Home, St. Louis, Mo.; Sullivan Building, St. Louis, Mo.; Pardee Hospital, Buffalo, N. Y.; Masonic Temple, Raleigh, N. C.; Bell Office Building, Montgomery, Ala.; Raymond Street Jail, Brooklyn, N. Y., etc., etc., etc., too numerous to mention.

The Whitestone Granite people have letters from all these parties praising Granite, which they have compiled in a handsome booklet, profusely illustrated, and which Mr. DeSmet is distributing.

Electric motors are taking the place of steam in many manufacturing plants, but for a quick change, the Gandy Belting Company, of Baltimore, Md., manufacturers of the Gandy stitched Cotton Duck Belting, seems to have broken all records.

On March 9 last the 150 H. P. steam plant of the Gandy company broke down.

By noon the following day, just twenty-four hours later, the entire plant was again in operation.

The 150 H. P. is furnished by two motors, one of 100 and one of 50 H. P.

At the time of the breakdown the 100 H. P. motor was in Philadelphia, which will give some idea of the difficulties encountered.

The Buffalo Wire Works Company, manufacturers of artistic metal work, wire cloth and wire goods, 61-73 Jackson Street, Buffalo, N. Y., state that it has been their one aim to reach the highest standard in the manufacture of wire cloth. They say that their machinery is of the very best and latest improved type, and that their engineering force is constantly making improvements. They have designed their wire lathing to take the place of wood lathing, which has been found an ineffective support for plaster when exposed to fire, water or vibration. They designate their lathing as plain, stiffened and close warp.

Plain lathing is a plain wire cloth and is usually secured to wooden furring strips. The general width is 36 inches, but any desired width can be furnished on short notice. Galvanized lathing has the advantage over plain lathing in the additional stiffness, by each joint being soldered, and being coated with metal prevents it from rusting.

Stiffened lathing is a cloth of the usual mesh used for lathing where V-shaped strips of No. 24 sheet iron are placed at intervals of seven and one-half inches. This makes a smooth and firm surface for plastering. They claim for their stiffened lathing that a smaller size of wire can be used, and the same stiffness obtained than with any other lathing. It is secured by driving a nail through the bottom of the V. No punch is needed. It is applied directly to the walls and timbers, without furring. Rolls average about 50 yards in length.

Close warp lathing is woven close in the warp, therefore called close warp, and made especially for certain kinds of plaster and cement, known as Windsor, Adamant and various others, and is used principally where fine surface or smoothness is required. This style of lath can be secured painted at an additional expense of one cent per square yard.

The Buffalo Wire Works Company also manufacture a wire fabric for reinforcing concrete. They will be pleased to furnish full particulars, prices, etc.

The Chicago Belting Company, Chicago, Ill., recently made for the Monarch Lumber Company, of Portland, Ore., an 84" three-ply Sea Lion waterproof leather belt. The entire mill was belted up with this brand of belting, and the mill contains



besides this one two other belts, one 60" and the other 48". The company says that to their knowledge this is the largest waterproof leather belt ever made.

There has been a large call for a grade of Dynalite which could be broken up in water and have the same force as if it was perfectly dry.

The American Dynalite Company, of Cleveland, O., are now bringing out such a grade, which has been perfected after a number of years of experimenting and study on the part of F. H. Briggs, the vice president and general manager, which grade has the other essential features of Dynalite but in addition thereto can be used in the water, as it is not affected by the same.

In accomplishing this no nitro glycerine, gun cotton or similar ingredient is used which would have a tendency to make the Dynalite more dangerous.

The one objection to Dynalite has now been overcome and they say now they have the most complete and best high explosive on the market.

There are a great number of consumers who prefer Dynalite but have heretofore objected to the water.

The appearance of this Dynalite is reddish in color, to distinguish it from the other grades.

The Sawyer Belting Company began to manufacture canvas stitched belting in 1896 in East Cambridge, Mass., and worked along with indifferent success for the first year or so. H. M. and C. H. Sawyer, who stood sponsors for the company, however, kept at work improving on their original ideas until five years afterwards they were making a belt second to none in the market. Business kept increasing to such an extent that they added more buildings.

In the fall of 1905 they found they had used up all the available room in the group of buildings they occupied, and decided that the best interests of the company would be subserved by moving the factory into the middle West, and Cleveland was finally selected as embodying many advantages.

The work of moving the factory was started in October, 1905, this being carried out on the unit plan; that is, one part of the factory was moved and started up at the Cleveland address before the second unit was stopped at the old address. So it was the morning of January 1, 1906, when the Sawyer Belting Company, of Cleveland, was fairly launched.

The plant's location—not only in the center of the manufacturing district at the junction of the Nickel Plate and C. & P. tracks, but, in addition, being on the great lakes—affords the best shipping facilities.

The success of the Sawyer Belting Company in the manufacture of canvas stitched belting is accounted for somewhat in that they have always been ready to adopt any feature that would make their position stronger with the consuming trade. This explains their growth and increase of factory area following their location in Cleveland.

The "Heatencook" range manufactured by the Steacy-Schmidt Manufacturing Company, of York, Pa., is a combined kitchen range and hot water heater. It is designed to utilize the great heat now being wasted by the ordinary cook stove or range. It is not an ordinary range with an attachment or water-back for heating water, but it is a special apparatus designed and constructed with the above object in view, and required a great deal of study and experiment to make it a success. Heating by hot water is by far more perfect and desirable than any other known plan. The "Heatencook" range is used for hot water heating only. It would be impossible to make any steam heater work a combined heater and cook stove. Write to them for illustrated catalogue.

CLASSIFIED ADVERTISEMENTS

Advertisements will be inserted in this section at the following rates:

For one insertion 25 cents a line
For two insertions 45 cents a line
For three insertions 60 cents a line

Eight words of ordinary length make one line. Heading counts as two lines.

No display except the headings can be admitted. Remittances should accompany the order. No extra charges for copies of paper containing the advertisement.

EMPLOYEES WANTED

WANTED.

If you are in need of or wish to sell anything which comes under any of these classifications, write us. If you have something not coming under these classifications we will create one for you.

THOROUGHLY CAPABLE OPERATOR

wanted for full charge of quarry and rock crusher. Address "X" care ROCK PRODUCTS.

BUYERS AND AGENTS WANTED

to sell our concrete mixers and cement block fence post and brick machinery. Send for circulars and prices. Address, Keller Concrete Machine Co., Kearney, Nebr.

DRAFTSMAN WANTED.

Experienced in estimating and detailing cut stone or terra cotta for large stone plant. Permanent position, if competent. Address Box 15, Syracuse, N. Y.

SUPERINTENDENT WANTED

For limestone quarry. Man capable of handling large plant, steam shovels, locomotives, etc. Address "J. L. A." care ROCK PRODUCTS.

FOREMAN WANTED.

An experienced and competent foreman for sand-line plant manufacturing white and colored face brick. Must have had practical experience in successful plant of this kind and thoroughly understand the operations of screening, drying, pulverizing, mixing, siloing, pressing and hardening of materials. References required. Write full details, stating where employed previously and in what capacity. Address ROCKAWAY BRICK CO., Rockaway, N. J.

EMPLOYMENT WANTED

POSITION WANTED

As superintendent of crushing plant by man of a lifetime experience. Address Box 764, care ROCK PRODUCTS.

SUPERINTENDENT FOR CEMENT PLANT.

Asst. superintendent of a large modern cement plant desires to change his position to one offering a larger scope for his abilities. Thoroughly experienced in the dry and wet processes, oil or coal fuel. A wide range of experience in cement plant construction and reconstruction. Would entertain a proposition to supervise the erection of a cement plant at home or abroad and manage same after completion. Age 43, of good habits, thoroughly reliable, and very energetic; best of references; 2 years in present position. Address 765, care ROCK PRODUCTS.

MACHINERY FOR SALE

FOR SALE.

No. 5 Nye water pump.
10 H. P. stationary engine.
Good condition. Address E. S. Gaylord, 3203 Daisy Ave., Cleveland, Ohio.

Attention, Quarrymen!

For Sale,—No. 8 Austin Gyratory Crusher.
No. 5 Austin Gyratory Crusher.
70-ton Vulcan Steam Shovel, 2-yard.
50-ton Bucyrus Steam Shovel, 1½-yard.
Thew size "O" Traction Shovel, ½-yard.
Little Giant Traction Sewer Shovel, 1½-yard.
Little Giant Traction Steam Shovel, 1-yard.
Hayward Orange Peel Bucket, 1-yard.
Hayward Orange Peel Bucket, 1½-yard.
Lidgerwood No. 71 Hoist.
Concrete Mixers, Concrete Buckets, Steam Rollers.
Air Compressors, Pumps, Boilers, Sewer Machines, Locomotives, Dump Cars, etc.

Willis Shaw Machinery Co.

171 La Salle St., Chicago, Ill.

MACHINERY BARGAINS.

- 1—Mansfield side crank throttling governor rocker valve engine, about 10x12, \$100.00.
 - 1—No. 0 Root Blower, \$50.00.
 - 1—9x14 double cylinder, double drum, Webster, Camp & Lane very heavy mining hoist on iron base through-out, practically new, with lot of cable for same, \$450.00.
 - 1—Very heavy derrick, will lift 20 tons, complete with hoisting engine for same, wire cables and wire guys. This is a very fine derrick, \$300.00.
 - 1—Very heavy derrick with hoisting engine, wire cables and guys, \$300.00.
 - 3—Small derricks with cable and guy wires, no hoisting engines, \$100.00 each.
 - 1—No. 4 Austin Jaw Crusher with elevator cables, buckets and screen, with small engine to run the stone crusher, \$450.00.
 - 1—Byers double cylinder double drum 6x7 hoisting engine on wooden base, no boiler, \$150.00.
 - 8—gang saws for sawing stone, \$200.00 each.
 - 1—Fine triple hoist for derrick work, \$200.00.
 - 1—6x4x6 duplex pump, \$50.00.
- Address Cleveland Beiting & Machinery Co.,
1922 Scranton Rd., Cleveland, Ohio.

BUSINESS OPPORTUNITIES**THE BEAL CORE DRILL.**

The best, cheapest and most effective core drill for testing quarries, coal and mineral lands. Borings made for foundations, records furnished of each test, of the foundations and cores taken out 3 or 4 inches in diameter to variable lengths. Any one wishing work of this kind done write me a postal card. Correspondence solicited. Address

EDWIN S. BEAL,
214 Woodlawn Ave., Lansing, Mich.

Crushers Cheap

Five old-style Universal crushers—two No. 1, three No. 1B—specially built for fine crushing; one No. 4 large capacity. Will sell at sacrifice. Replaced by new style improved crusher.

Address,

Eureka Stone Crusher Co.
CEDAR RAPIDS, IOWA.

PARTIES INTERESTED IN CLAY

that will make first-class fire brick, paving brick or pottery will do well to address **INDUSTRIAL COMMISSIONER SOO LINE**, Minneapolis, Minn.

FOR SALE.

Half interest and management if desired in well established brick and tile plant in Wisconsin city of 15,000. Lots of clay, face of bank 60 ft., perfect drainage, little top soil, sand bank adjoins. Burns 75% select rich cream color brick that meets government requirements. Tile of the best. Coal distributing point. Market by water and two railroads. Prosperous and growing trade. Cheapest place to manufacture in the state. Must build larger. Owners have other business. Address

INDUSTRIAL DEPT. SOO RY.,
Minneapolis, Minn.

For Producing Concrete Aggregates

of any desired size and uniform size, **NO CRUSHER** can equal

The Universal Crusher

It can be instantly adjusted to crush material the size of its opening down to $\frac{1}{4}$ inch and finer. It will handle the hardest rock, without distress, and requires less power than other crushers. **Price for a real Crusher from \$75.00 up.** Let common sense be your judge. Investigate. **Buy the Best.** Beware of cheap improvements. Don't be misled. Write today. Call or address

UNIVERSAL CRUSHER COMPANY

Works 2nd and 10th Sts., West
CEDAR RAPIDS, IOWA

Telephone: 1115

CEMENT WALKS, BUILDINGS, ETC.

Cement sidewalk construction; making concrete blocks and buildings; estimating, profits, etc. Practical book of details, postpaid, 50c.

Address, DeGraff Pub. Co., Peoria, Ill.

EASTERN LIME PLANT.

One of the best equipped in the United States. High calcium quarry running uniformly about 98% pure. Will sell outright or retain substantial interest in connection with well qualified parties and conduct the sales department in markets well established already. Fuel cost, labor and all other details of the lime business well adjusted to production. Plant now running and in first class condition in every particular.

Address **BOX 702, care ROCK PRODUCTS.**

IMPORTANT Advertisers—Take Notice

Changes of Copy

Must be in this office by the Fifteenth of the month, if proofs are desired; if no proofs are required the desired changes can be made if copy is received by noon of the Nineteenth.

New Advertisements

To insure proper classification, should be in this office by the Fifteenth of the month, but they can be inserted in the last form going to press if received by the Nineteenth. The punctual publication of the paper admits no deviation from these rules. Advertisers are earnestly requested to co-operate with us.

THE FRANCIS PUBLISHING COMPANY
355 Dearborn Street, Chicago, Ill.

Some Bargains in Quarry Equipment

CRUSHERS

One No. 8 Austin crushing plant with No. 5 recrusher, elevators, screens, power plant, etc. Very complete and good as new.
One No. 8 Gates plant with No. 4 Crusher, elevator and screens and power. Fine condition.
One No. 7 $\frac{1}{2}$ McCulley plant and No. 4 crusher, elevator, screen and power. Used one season.
Several No. 5's, No. 4's, and No. 3's.

COMPRESSORS

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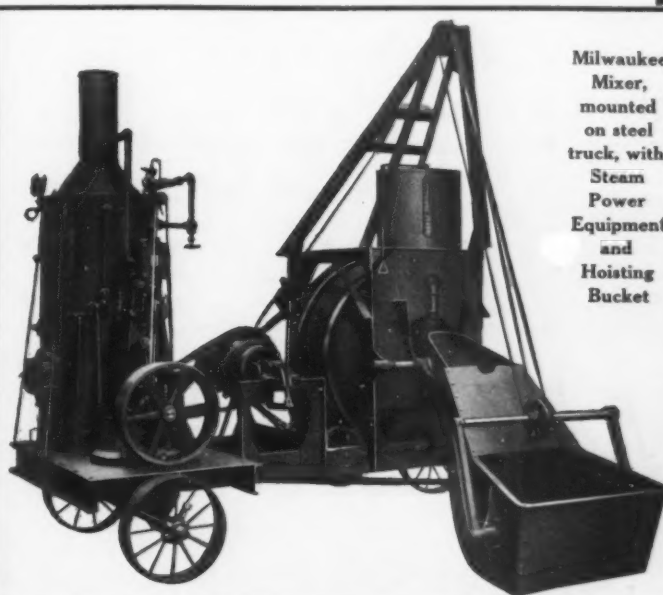
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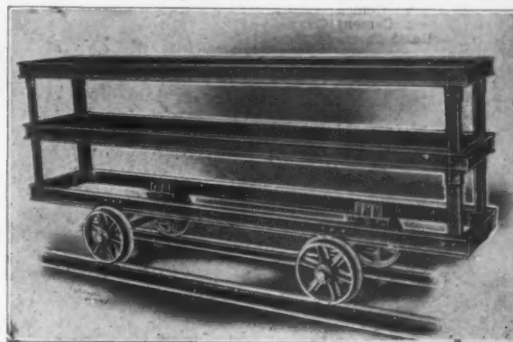
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Catalog No. 34

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The Francis Publishing Company.

355 Dearborn Street, Chicago, Ill.

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It gives us pleasure to testify that for putting anything before the trade that you reach, we have never used anything which gave better results. The number of bona fide inquiries which led to eventual sales was remarkably great.

It has always been a great advantage to us that your representatives have been so wide awake in looking out for our interests as we suppose they do with other advertisers' interests, in traveling about the country, and I can recall a number of sales that came directly through pointers given by you to us from information received on the road.

You need not have any hesitancy in referring any doubtful inquirer to us in regard to the value of your advertising columns.

Very truly,

MARSH CO.

Per (Signed) G. C. Marsh.

**It has paid Mr. Marsh
It will pay you.**

There are others of whom similar information may be obtained. A great number of them. We will tell you about them later.

Rock Products

355 Dearborn Street,

CHICAGO

Tell 'em you saw it in ROCK PRODUCTS

ALLIS-CHALMERS CO

Style "K" Rock and Ore Breakers

NO CLOGGING

The stone spouts directly from the hopper into the opening between the head and the concaves. This arrangement enhances the feeding capacity and overcomes the tendency to arch and prevent wear on spider.

Have Large and Unobstructed Feed Openings

NO LOSS WORKING TIME

The hopper rests directly on the top of the shell, near the upper ends of the concaves, thus reducing the height of breaker from foundation to feeding floor.

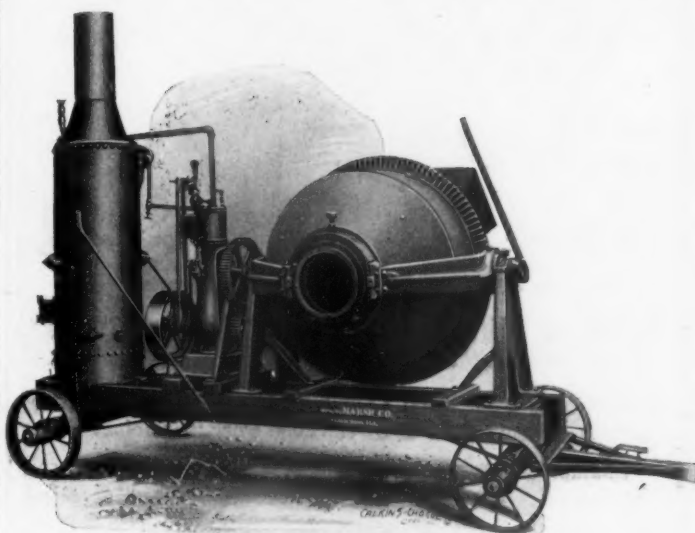


**Built to Meet
Operating Conditions**

GENERAL OFFICES:
Milwaukee, Wis.

District Offices
in all Principal Cities

Marsh Up-to-Date Line of Mixers



MARSH-DEXTER—Best and Simplest Tilting Mixer.

MARSH'S MIXERS comes nearest of meeting all the requirements of all conditions met in actual use.

Different types to meet varying conditions.

MARSH-CAPRON MFG. CO.

990 Old Colony Bldg.

CHICAGO, ILL.

WATCH

your present maintenance costs—
then install

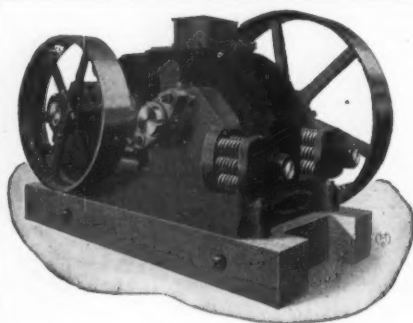
Tisco Manganese Steel Crusher Parts

and you will appreciate the wear resisting properties of this steel and be surprised at the economy you find.

Ask for Bulletins 104 or 105.

TAYLOR IRON & STEEL CO.
High Bridge, New Jersey

Tell 'em you saw it in ROCK PRODUCTS.



You Should Use Our Type of CRUSHING ROLLS

Instead of Small Size Crushers

to produce the fine product now so much in demand for top dressing in road work and in reinforced concrete. 2 to 3 times larger capacity with $\frac{2}{3}$ of the horse power, less cost for repairs and less head room required. Also used between Coarse crushers and fine grinding machines on both the raw and finished sides in **Cement Plants**. These machines are massive in construction and have given entire satisfaction under the most severe service.

Built in sizes 24x8 to 42x16 in. Write for Catalogue D 4.

Chalmers & Williams, Inc.

1929 Commercial National
Bank Building, CHICAGO



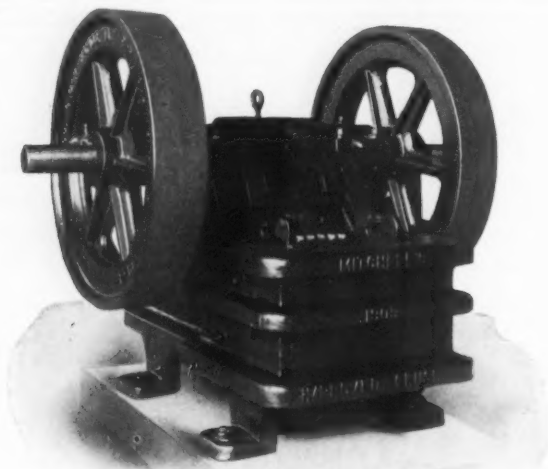
HOWELL'S Celebrated Ball Bearing Heavy Geared Post Drills

For boring anything that
an Auger will penetrate.

Awarded Gold Medal, St. Louis.

We make 40 different styles machines run by Hand, Compressed Air and Electricity for boring Fire Clay, Coal, Rock, Rock Salt, Gypsum and Plaster Rock. Send to day for our handsomely Illustrated Catalogue.

HOWELL MINING DRILL CO., PLYMOUTH, PA., U. S. A.
(ESTABLISHED 1878.)



20 DIFFERENT SIZES

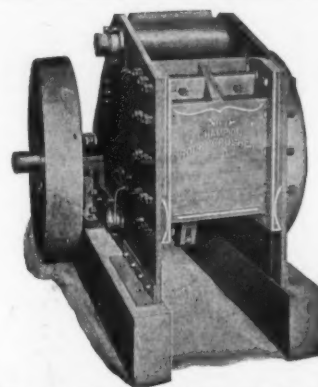
Mitchell's Improved Crusher

reduces any refractory material from 4 inch size to any size desired down to sand in one operation. It is instantly adjustable while running. You will appreciate the convenience and money-saving of this operation if you understand crushing problems.

There is no crushable substance too hard for the No. 3 Mitchell Improved. It's a rock crusher built with rock-like solidity. Ten minutes with our pamphlet "Mitchell Improved Crushers and what they will do" explains all these features. Send a postal for it.

EUREKA STONE & ORE CRUSHER CO.

Cedar Rapids, Iowa



No. 5 Champion Steel Rock Crusher, 11x26 in. Opening.

Speaking of ROCK CRUSHERS

there are over 3,000 Champion Machines in use. Every machine is speaking for us by the good work it is doing.

Champion Crushers are made of steel. They work well and last well. We offer them as the best and most economical crushers made.

Five different sizes, from 75 to 300 tons daily capacity. Elevators, screens, conveyors, engines, boilers. Complete plants installed.

HANDSOME CATALOGUE FREE ON APPLICATION

The Good Roads Machinery Co.
KENNETT SQUARE, PA.

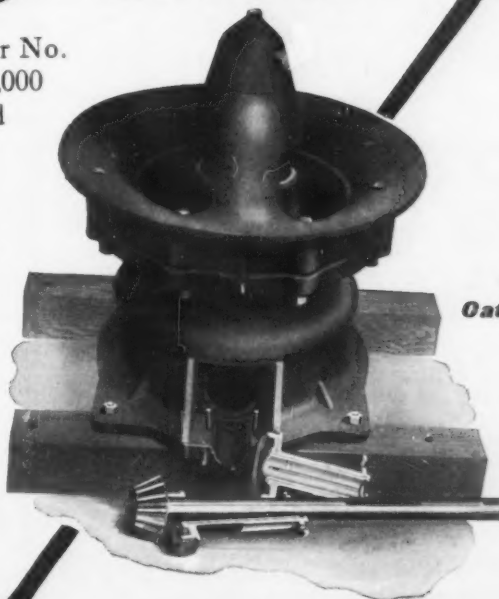
Tell 'em you saw it in ROCK PRODUCTS

YOU HAVE FOUND a rock crusher combining the continuous crushing movement, large capacity, uniform product and durability of the old-line gyratory breaker, with the advantages of low feed and reduced weight.

These features are found in one machine and in only one—the

Symons Crusher

HEIGHT AND WEIGHT—The Symons Crusher No. 5 measures 3 ft. 9 in. from sills to rim; weighs 17,000 lbs. Other sizes show similar economy in height and weight. **STRENGTH**—The short stocky frame, the thick three-arm bottom spider, the heavy crown and the great central bolt, clamping frame and crown together—all guarantee a degree of strength unattainable in crushers of the lever-shaft type. **DURABILITY**—The long eccentric bearings, dust proof and automatically oiled, the absence of the suspension bearing—the simplicity of the entire machine—these features guarantee reliable and economic operation under the severest conditions.



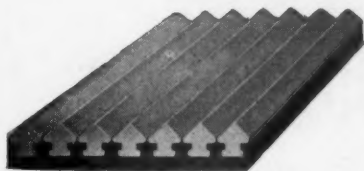
Write for
Catalog No. 156

The T.L. Smith Co.

Majestic Bldg.,

Milwaukee, Wis.

A Tempered Steel Jaw Plate for Blake Type Crushers



Canda Tempered Steel Crushers Jaw Plate

Patented March 31, 1908

CHROME STEEL WORKS

CHROME, N.J., U.S.A.
(FORMERLY OF BROOKLYN, N.Y.)

☛ The Canda Tempered Steel Jaw Plate for Blake Crushers is composed of Forged and Rolled Chrome Steel Bars, cast-welded and also mechanically interlocked into a backing of tough steel—and the wearing face is tempered to extreme hardness. We are equipped to supply both corrugated and smooth face plates for all sizes and makes of Blake Crushers.

☛ The Canda method of cast-welding forged and tempered steel bars into a mild and tough Steel Backing, is adapted also to the construction of Cone Heads for Gyratory Crushers, Segments for Corrugated Rolls, etc., etc.

☛ Our products in this line are sold with our special guarantee that they will wear longer, give better satisfaction and, at our price, prove more economical than any others now on the market.

— Send for Descriptive Pamphlet —

Represented by

J. F. Spellman, 202 Century Building, Denver, Colo.

George T. Bond, Easton, Pa.

George W. Myers, San Francisco, Cal.

AUSTIN GYRATORY CRUSHER

The World's leading rock and ore breaker.

The only self lubricating Crusher.

The only Crusher having double countershaft bearing.

Simple construction, correct design.

Thousands in use.

Plans and specifications furnished for any sized plant.

Send for Catalogue No. 17.

All experienced users recognize that the efficiency and durability of the suspension bearing as applied to Gyratory Crushers, depends upon locating the bearing at the point of least gyration or movement of the main shaft.

A perfect suspension can be made only by locating the bearing at the point where there is no movement of the shaft. That being a mechanical impossibility it follows that superiority is obtained in fixing the bearing at the point of least gyration of the shaft.

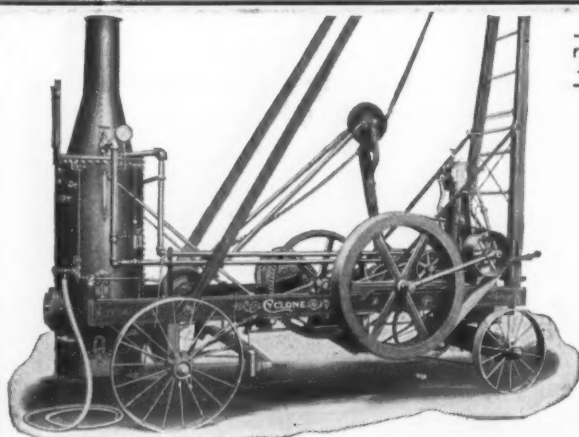
As the accompanying cut will show, the movement of the shaft at the point of suspension in the Austin Crusher is reduced to the minimum and practically eliminated. Consequently the highest possible degree of efficiency and durability is obtained.

Austin Manufacturing Co., Chicago

Mussens Ltd., Montreal, Can., Canadian Sales Agents.



New York City Office
1632 FULTON BUILDING
Hudson Terminal



THE CYCLONE **WINS** BY BIG ODDS

The Competitive Drilling Test

just finished at the Dolese-Shepard Company's quarry at Gary, Illinois, has proven the superiority of Cyclone Drills, finishing far ahead of any of the six drills in the test. Total number of feet drilled, 1595; drilling 5 ft. 10 in., per hour, or 1 ft. 6 in. more per hour than the highest record of any other machine. Holes were all 5½ inches diameter in hard lime-stone rock; not one penny was spent for repairs of any character.

This is just another record of the many which the Cyclone Drill has to its credit; let us tell you more about Cyclone Drills and their records.

WRITE US TO-DAY—DEPT. "C"

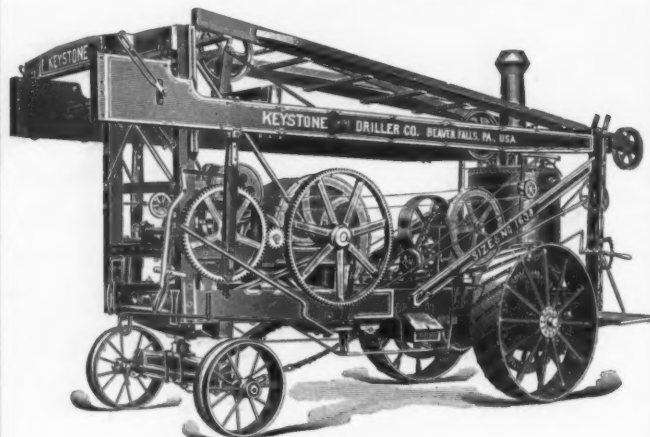
THE CYCLONE DRILL COMPANY,

ORRVILLE, OHIO

CHICAGO OFFICE—419 Fisher Bldg.

NEW YORK OFFICE—1456 Hudson Terminal Bldg.

For Big Blast Holes **KEYSTONE** CABLE DRILLS



Catalog No. 4

Keystone Traction Drill Co.

Monadnock Bldg.,
CHICAGO

BEAVER FALLS, PA.,
170 Broadway, New York

CARTHAGE,
MISSOURI



95-C IN SANDUSKY PORTLAND CEMENT COMPANY'S QUARRY

Bucyrus Shovels Are Loading Crushed Stone and Digging Blasted or Unblasted Cement Rock in the Leading Quarries in the United States.

THE BUCYRUS CO.

Branch Offices
NEW YORK
SAN FRANCISCO

Main Office & Works:
South Milwaukee, Wis.



Deep Blast Hole Drilling

Is accomplished more economically than by any other method with the

"American" Drilling Machines

There is 40 years' experience behind these drills—they are standard.

Where electric power is available, equipped with motor they form the most portable and economical drill for quarry use.

Equipped with any power they are backed by the experience and reputation of the world's oldest and largest builders of this kind of drilling machinery.

Tell us your blast hole requirements. We have 59 regular styles and sizes of machines for your selection, made in types to meet every possible condition of work.

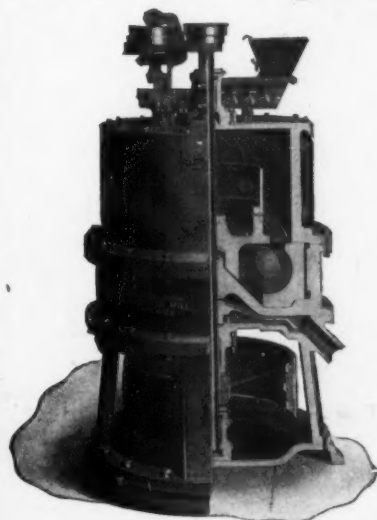
Write for our new catalog No. 105, the most complete "Drill-Hole" catalog ever issued.

THE AMERICAN WELL WORKS

General Office and Works: AURORA, ILL., U. S. A. Chicago Office: First National Bank Building

Tell 'em you saw it in ROCK PRODUCTS

The Fuller-Lehigh Pulverizer Mill



Cement Companies equipped with Fuller Mills advertise the fact that the consumer gets 38 pounds more of the **IMPALPABLE POWDER** or **REAL CEMENT** in every barrel of cement produced by **The Fuller Mill** than by any other

Produces Commercially

Cement having a higher percentage of Impalpable Powder than can be obtained by any other mill. Tests show that the tensile strength of a 1-5 mortar made with cement pulverized by the Fuller Mill is higher than the tensile strength of a 1-3 mortar made with cement pulverized to the fineness required by the Standard Specifications.

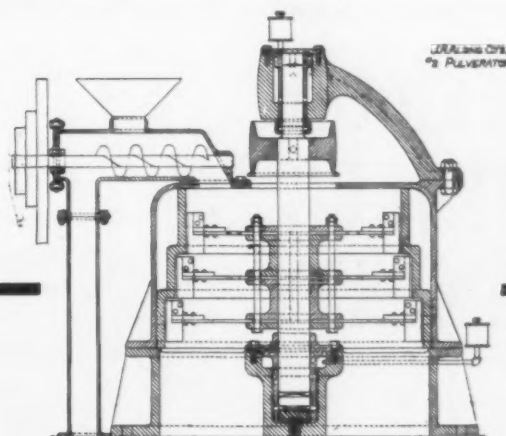
Lehigh Car, Wheel & Axle Works

Main Office: CATASAUQUA, PA.

New York, N. Y.

Kansas City, Mo.

Hamburg, Germany, Alsterdamm 7.



THE ALSING PULVERATOR No. 2

These machines are designed for very fine grinding and will reduce the material from a 2½ inch size to an impalpable powder. The grinding is done by the percussion principle instead of abrasion, etc., as in other makes. These Pulverators have demonstrated by actual use a great saving in cost of wear, tear, and maintenance. Simple in construction with fewer intricate parts to get out of order. They are so substantially constructed they will last a lifetime.

The J. R. Alsing Engineering Co.

INCORPORATED

136 LIBERTY STREET, NEW YORK



"LITTLE GIANT" LOADING BLASTED ROCK.
Diamond Portland Cement Co., Middlebranch, O.

Giant Boom Shovels, six sizes, 1½ to 5 cubic yard dippers. **Little Giant Shovels**, two sizes, 1 ¼ cubic yard dippers. **Revolving Shovels**, three sizes, ¾ to 1½ cubic yard dippers. **Steam or Electric Power. Traction Wheels or Railroad Trucks.** Send today for booklets.

VULCAN

Steam and Electric Shovels

are the best that money can buy because they are correctly designed and substantially built. Every part is made of material which we know from our **thirty years' experience** in high class steam shovel building to be the **best for the purpose**. Before shipment each shovel is **set up complete** in our yards, **thoroughly tested under full steam** and all parts **carefully inspected and adjusted**. You are invited to witness this test and the shovel isn't shipped until **both of us are satisfied** that it is right in every respect. In addition to this, we give you the benefit of a **10 day trial test** in your own quarry and you don't have to accept the shovel until we have **demonstrated on your own work** that it is just as represented. Every shovel we build is covered with an **iron clad guarantee** to give complete satisfaction. Write us today, giving a description of your material and the amount you wish to handle per 10 hours and we will promptly send full information, specifications, prices, etc., of a shovel which we will guarantee to do your work satisfactorily.

THE VULCAN STEAM SHOVEL CO.

Toledo, Ohio

NEW YORK OFFICE: 45 Broadway;
Telephone 4039 Rector

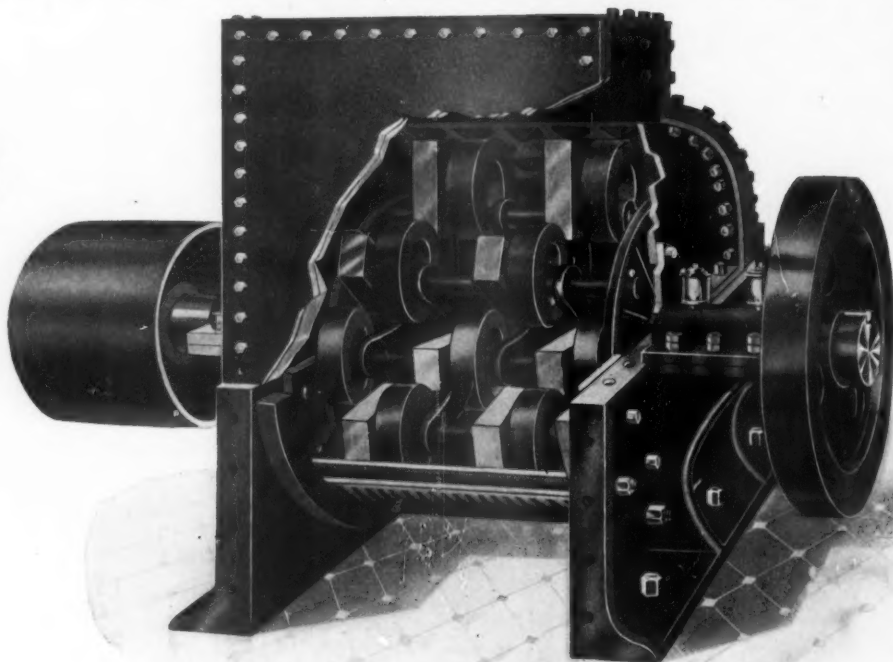
DENVER OFFICE
305 Appel Bldg.

CHICAGO OFFICE: 1301-2-3 Great Northern
Bldg.; Telephone Harrison 2838

Tell 'em you saw it in ROCK PRODUCTS

AMERICAN PULVERIZER COMPANY

**410
Mermod-
Jaccard
Building
ST. LOUIS
MO.**



The above is the machine that gave such splendid satisfaction to the subscriber of the following letter.

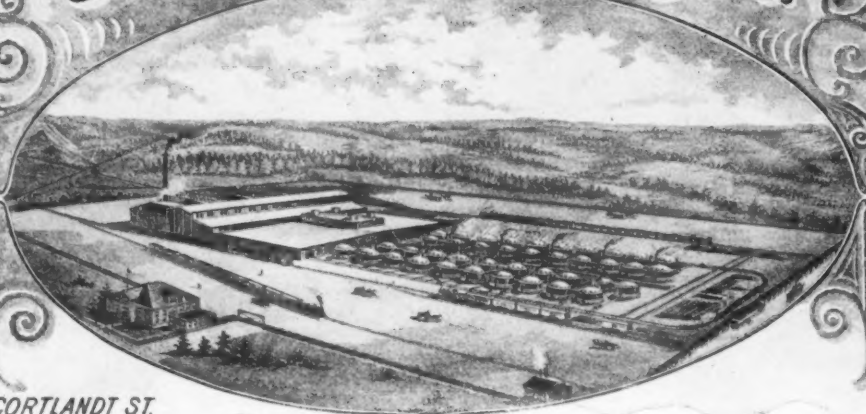
R. W. LYLE, President & Gen'l Mgr.

J. F. HARPER, Vice President.

L. L. LEWIS, Secy & Treasurer.

Great Eastern Clay Co.

**FIRE
PROOFING,
WALL
COPING,
FLUE
LININGS.**



**VITRIFIED
ELECTRICAL
CONDUITS,
SPECIAL
CLAY
PRODUCTS.**

Offices: 39 & 41 CORTLANDT ST.
TELEPHONE 128 CORTLANDT.

NEW YORK, April 8th, 1910.

American Pulverizer Co.,
410 Mermod-Jaccard Bldg., St. Louis, Mo.

Gentlemen:—

Some time ago while watching the operation of the American Pulverizer we purchased from you about a year ago, I recalled the fact that I promised you, at the time purchase was made, that if the Machine proved equal to your guarantee, we would, with great pleasure, acknowledge its merits. After several months' operation of the Pulverizer it affords me pleasure to state that we are pulverizing vitrified sewer pipe, paving brick and other vitrified material, reducing this extremely hard vitrified clay so it passes through a sixteen mesh screen and at the rate of fifty to sixty tons per day. We have discontinued the use of our extra heavy dry pans and roll crushers, which proves that, positively, your Pulverizer is superior for that class of work and less costly to operate. Furthermore, we congratulate ourselves on having secured a Machine which fulfilled every guarantee.

It is a pleasure to recommend such an invention. Your Pulverizer, in our opinion, will eventually take the place of all roll crushers and dry pans. In fact, all other pulverizer devices.

Wishing you the success you merit, we remain,

Yours very truly,

GREAT EASTERN CLAY COMPANY.

Robert W. Lyle PRESIDENT.

Tell 'em you saw it in ROCK PRODUCTS

GRINDING Mill Capacity is greatly increased, often doubled, by prompt removal of the fines as fast as formed.

In the old method of operation, the fines were fed in with the coarse particles, cushioning the crushing action, and retarding the whole operation.

Osborne Pneumatic Apparatus removes the fines continuously, leaving the coarse particles for further reduction.

An Osborne Apparatus costs much less than a double equipment of grinders. Shall we send our catalogue?

■ Better ask for catalogue of Reilly Multicoil Feed Water Heaters at the same time.

The Griscom-Spencer Co.

90 West Street, New York

For Grinding Limestone

We Guarantee that

One Raymond Mill with Air Separator

will deliver at point of storage

3½ Tons per hour---98%, 200 mesh.

Think what that means. Compare it with the capacity of other mills.

The nearest approach to this capacity that we find claimed by other mills is

2½ Tons per hour

and that is merely for the actual grinding in the mill. It does not include separating or delivery of the finished product to point of storage, which must be accomplished by additional expensive machinery which is entirely eliminated in the Raymond System. The Raymond System does it all.

Furthermore, 3½ tons per hour is our conservative guarantee. As a matter of fact, where the material is favorable, the Raymond System can deliver and is actually delivering, a finished product at the rate of

6½ Tons per hour---92%, 200 mesh.

We can demonstrate to any cement manufacturer that he is losing money if he is not using the Raymond System for grinding his raw material and coal.

This is a big statement and we make it with a full realization of its gravity and importance to the Cement Industry.

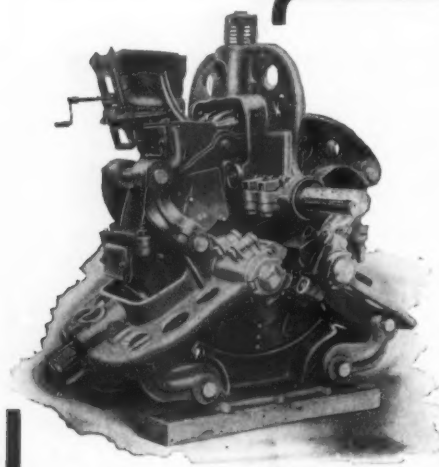
We can "make good" on this statement.

Do you want us to "show you?"

Raymond Brothers Impact Pulverizer Co.

517 Laflin Street, Chicago

Tell 'em you saw it in ROCK PRODUCTS



MAXECON

Means MAXimum of ECONomy

Years of experience with the assistance of our hundreds of customers has found THE SOLUTION OF GRINDING HARD MATERIALS. The MAXECON PULVERIZER combines highest EFFICIENCY, greatest DURABILITY and assured RELIABILITY. Uses the LEAST HORSE POWER per capacity. Embodies the features of our Kent Mill with improvements that make it MAXECON.

WE DO NOT CLAIM ALL of the CREDIT for this achievement

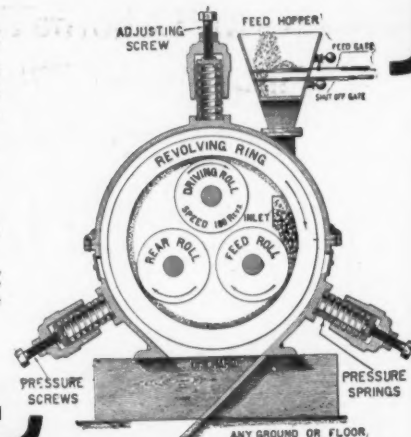
We have enjoyed the valuable suggestions of the engineers of the Universal Portland Cement Co. (U. S. Steel Corp.), Sandusky P. C. Co., Chicago Portland C. Co., Marquette Cement Mfg. Co., Western P. C. Co., W. H. Harding, Prest., Coplay P. C. Co., Cowham Engineering Co., Ironton P. C. Co., Alpena P. C. Co., Castalia P. C. Co., Pennsylvania P. C. Co., and many other patrons.

THE RING WOBBLES

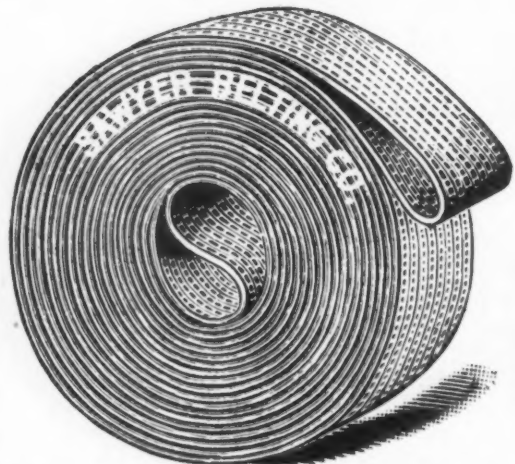
The FREE WOBBLING POUNDING RING instantly and automatically ADAPTS its position to the variations of work. Its GRINDING ACTION is DIFFERENT than any other; besides the STRAIGHT rolling action of the rolls, the SIDE to SIDE motion of the ring makes the material subject to TWO crushing forces and DOUBLE OUTPUT results.

KENT MILL CO.

170 BROADWAY, NEW YORK CITY
LONDON, W. C., 31 HIGH HOLBORN
CHAM OTTENBURG 5, WINDSCHEID STRASSE 40, BERLIN



THE ONLY WAY



TO APPRECIATE THE
ECONOMICAL VALUE
OF SAWYER STITCHED
CANVAS BELTING IS TO
**GIVE IT A TRIAL. IT'S
BEEN MAKING GOOD
FOR TWENTY YEARS.**

FOR FLAT, TROUGH, OR BUCKET ELEVATING, MAIN DRIVING, IT HAS PROVEN ITSELF TIME AND TIME AGAIN

A GENUINE MONEY SAVER

ADDRESS ENG. DEPT.

SAWYER BELTING CO.

CLEVELAND, O.

Tell 'em you saw it in ROCK PRODUCTS

Williams Raw Material Grinders

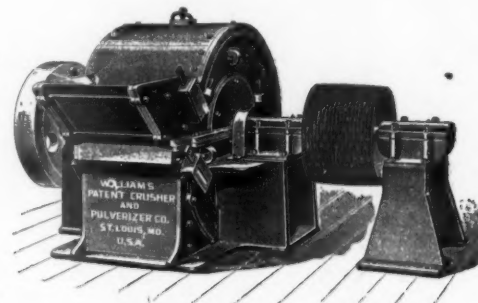


The "New Williams" Universal, our fine grinder, is used for preliminary work ahead of the Tube Mill, capacity No. 3 size, 800 bbls. in 22 hours, 95 per cent. through 20 mesh, with 40 to 50 horse power.

Also used extensively for fine grinding on Gypsum, Lime, Coal and Shale.

The "Vulcanite" Mill, our coarse grinder, prepares raw material ahead of Roller Mills. The No. 3 size has a capacity of 20 tons per hour, fineness, $\frac{1}{2}$ -inch, $\frac{1}{4}$ -inch and $\frac{1}{8}$ -inch, horse power 40 to 45.

Over 1550 machines in daily operation.
Bulletin No. 12 gives further details.



The Williams Patent Crusher & Pulverizer Co.

Works: 2701 North Broadway, St. Louis, Mo.
Sales Office: Old Colony Building, Chicago
San Francisco Offices: 428 Monadnock Building

GET THE BEST Finest Line of Gypsum Machinery

MADE

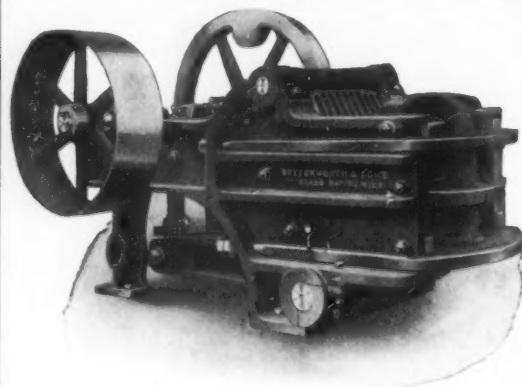
KETTLE CRUSHER NIPPERS

ASK FOR CATALOG OF

MOGUL NIPPERS. OPEN DOOR POT CRUSHERS

Best Mills in the United States Have Them

McDONNELL BOILER & IRON WORKS, Des Moines, Iowa, U. S. A.
"Formerly Des Moines Mfg. & Supply Co."



Nippers—made in 3 sizes.

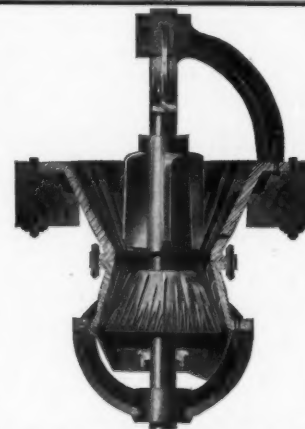
Jaw and Rotary CRUSHERS

For all Rocks and Ores (Softer than Quarts)

GYPSUM MACHINERY — We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

Special Crusher-Grinders for Lime

Butterworth & Lowe
17 Huron Street, Grand Rapids, Mich.



Crackers—5 sizes—many variations.

Tell 'em you saw it in ROCK PRODUCTS

Stucco Retarder

Strong
Uniform
Fine Ground

RETARDER

We are the oldest Retarder firm in the United States, and above is our motto. New fire-proof plant and prompt service.

FREE SAMPLE ON REQUEST

Chemical Stucco Retarder Co.

WEBSTER CITY, IOWA.

INCORPORATED 1895

CUMMER CONTINUOUS PROCESS

FOR

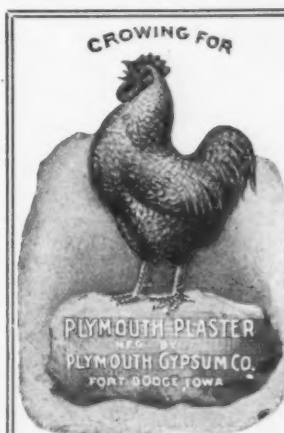
**CALCINING
GYPSUM**

NO KETTLES
USED

PLANTS IN
OPERATION

Great Saving in Cost of Manufacture and Quality of
Product Guaranteed.

The F. D. CUMMER & SON CO., Cleveland, O.



**PLYMOUTH
CEMENT**

AND

**WOOD FIBER
PLASTER**

The Brand that's Made from Pure
Gypsum Rock

WRITE US FOR PRICES AND
ADVERTISING MATTER

Plymouth Gypsum Co.

Fort Dodge, Iowa

RETARDER Wood Fiber

THE OHIO and BINNS RETARDER CO.
PORT CLINTON, OHIO

Reliable Stucco Retarder=Strong=Uniform in Strength=
Duplicate power plant (electric and steam power) installed so as to preclude any possibility of shut down and consequent shut down of mixers who depend upon us for their supply of Retarder. We have a capacity large enough to supply every retarder user in the U. S. and Canada, and some to spare for Europe. Our mills are fireproof in every particular. Write us for prices and information.

THE OHIO and BINNS RETARDER CO.
PORT CLINTON, OHIO

Tell 'em you saw it in ROCK PRODUCTS



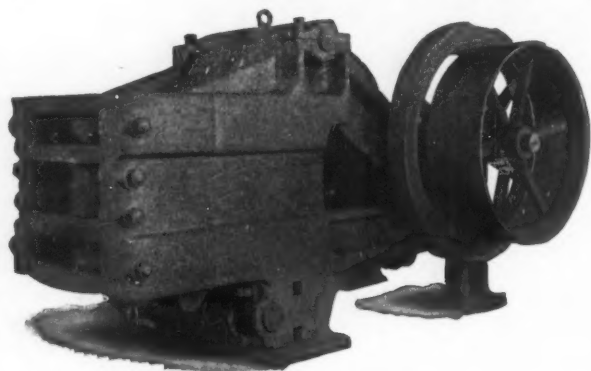
ENTERPRISE PLASTER MIXER

NOISELESS,
DURABLE and EFFICIENT.

For Mixing Hair Fibre, Wood Fibre and
Retarder with Dry Plastering
Materials.

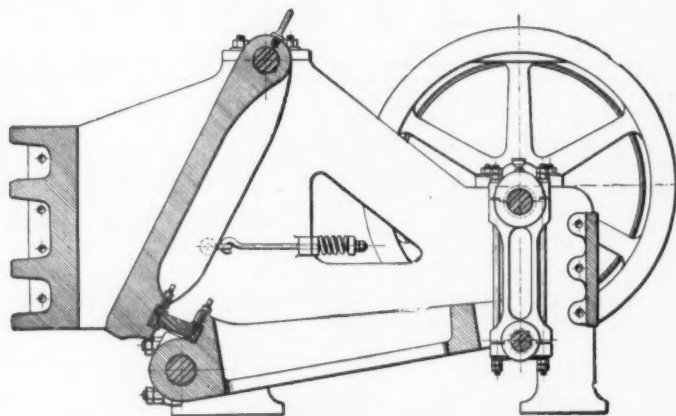
Calcining Kettles

Jaw and Rotary Crushers for Gypsum, Reels,
Vibratory Screens, Hair Pickers and Trans-
mission for applying power.



EHRSAM NO. 4 JAW CRUSHER.

This machine will handle large chunks and reduce from 30 to 40 tons of
Gypsum per hour to 2½-inch maximum or smaller if wanted.



NO. 4 JAW CRUSHER, SHOWING SECTIONAL VIEW OF NIPPER.
The jaw opening at inlet is 18x28 inches.

The J. B. Ehrsam & Sons Mfg. Co.,

BUILDERS OF

COMPLETE EQUIPMENTS FOR PLASTER MILLS

Enterprise, Kansas

Tell 'em you saw it in ROCK PRODUCTS

When "Best" Happens to be "Cheapest"

No architect, contractor or builder deliberately prefers inferior materials. None is indifferent to possible improvements. Every man wants the "best" construction—but, only so far as "best" is consistent with his estimates of cost. Now when the whole weight of building experience stamps a certain type of construction as "best," and cost is reasonable, then the sentiment in favor of that construction predominates. And this is precisely the situation with regard to

ADAMANT PARTITION

Consisting of

Sackett Plaster Board

and

Gypsinite Studding

(Fireproof)

Which is an economical combination of LATHING and FIREPROOFING in one inexpensive commodity—Composed of alternate layers of strong, fibrous felt paper and calcined gypsum—Made in sheets 32"x36"; $\frac{1}{4}$ " to $\frac{1}{2}$ " in thickness—Used in place of inflammable wood lath, metal and other lathing materials for ceilings, walls and partitions in all classes of buildings—And in a great variety of ways, as sheathing, insulation, sound deadener and fire retardent—Economical in construction—A perfect non-conductor of heat, cold and sound—Avoids lath stains, buckles, cracks and warping of the frame due to excessive moisture, as the bond between plaster and the DRY BOARDS is perfect.

(Fireproof)

Which does away with inflammable wood studding and together with Sackett Plaster Board, makes an absolutely FIREPROOF PARTITION—Consists of nailing strips completely imbedded in and protected by Gypsinite Concrete—Stock size 3"x3" in lengths up to 12 ft.—Weight about 3 lbs. per linear foot.—Made straight and true, insuring plumb partitions, thus saving plaster—Handled, erected, nailed into, exactly the same as wood studding—The latest Advance in the direction of a light, fireproof partition—Sackett Plaster Board over Gypsinite Studding, plastered according to instructions, forms a wall $4\frac{1}{2}$ " thick, of much LIGHTER weight than any other fireproof partition.

Most Advantageous of Any Fireproof Construction Known

ADAMANT PARTITION is ideal—strong, durable, sound-proof, fireproof, non-conductor of heat and cold, light weight—which means economy in the steel structure—perfect plastering surface—hollow space for concealment of pipes and wires—**everything** that modern construction demands; and the cost need not deter any one, because SACKETT PLASTER BOARD OVER GYPSINITE STUDDING is inexpensive as well as the best form of fireproof construction known.

Because it is best, architects do themselves credit, and their clients justice, when they specify Adamant Partition.

Because these materials free the Contractor from variations in lath quality and uncertainties of lath supply, giving him the advantage of great economy in time and labor.

Because of the widespread and enthusiastic sentiment in favor of Sackett Plaster Board and Gypsinite Studding, and the absence of price obstacles, every material dealer should seize the opportunity to increase sales and add a new source of profit by featuring these materials.

And every builder should take steps at once to acquaint himself with the protection, advantages and economies of Sackett Plaster Board and Gypsinite Studding, composing Adamant Partition.

Write us for literature, information, prices, samples—anything in our power to aid you in getting the best materials for your purpose.

UNITED STATES GYPSUM COMPANY

New York

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Chicago

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Kansas City

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"NIAGARA" IS THE BRAND

We cannot dwell too strongly upon the increased bulk and consequent greater covering capacities of our "NIAGARA" line of wall plasters, their favorable working qualities under the mechanics' tools and final strength.

Niagara Neat Cement

Niagara Sanded Mortar

Niagara Wood Fibre (Wood Pulp)

Dealers realize the additional dollars in the handling of our products because of their preference by the trade and good sense is displayed in pushing their sale. MIXED CAR LOAD SHIPMENTS of wall plasters, hydrated finishing lime, plaster board, sand plaster, and calcined plaster for finishing purposes.

ALL BUSINESS DIRECT WITH SALES OFFICE.

NIAGARA GYPSUM CO.

BUFFALO, N.Y.

THE FULLER ENGINEERING CO.

DESIGNING, CONSTRUCTING AND OPERATING
ENGINEERS ANALYTICAL CHEMISTS

CEMENT MILLS A SPECIALTY

OFFICES: ALLENTOWN NAT. BANK BLDG. ALLENTOWN, PA.

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Tests and Inspection of Cement—Reinforcing Steel and all Cement Materials and
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Cement Properties and Existing Concrete Structures—Design of Cement Plants and
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Buffalo Branch, CHAS. C. CALKINS, Manager

322 W. Genesee Street.

Not the hardest, but the toughest and best Wall Plaster made—Can be applied with less labor. Has greater covering capacity than any other similar material

J. B. KING & CO., 17 State Street, New York.

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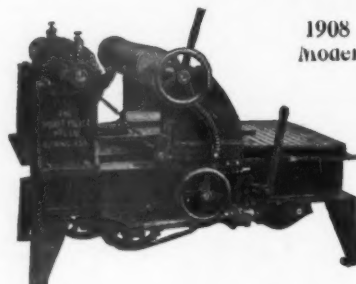


are right in our line. Carrying an immense stock of blanks, we can fill your order at once.

If in a hurry, wire us.

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The Shuart-Fuller Improved Fiber Machine



1908 Model

Has an automatic, proportional, increasing feed, which keeps grade of fiber uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors, but write for descriptive circular and terms to

The Shuart-Fuller Mfg. Co.

ELYRIA, OHIO

THE SHUART-FULLER CO., Elyria, Ohio.

Gentlemen:—We are just in receipt of advice from our New Mexico plant wherein they state that the Wood Fiber Machine recently shipped by you is doing all that we have asked of it and running very fine.

St. Louis, June 17, 1907.

ACME CEMENT PLASTER CO.,
By Jas. R. Dougan, Sec.

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Write for
Samples,
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You will be
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If you are up-to-date, you know that

Beaver Board

Makes the Most Beautiful, Durable and
Economical Covering for all Kinds
of and Walls Ceilings.

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LIME &
CEMENT CO.

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BUFFALO WIRE WORKS CO.

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We make

Wire Cloth

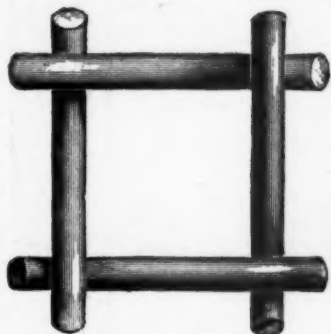
From the coarsest to the
finest, for all purposes,

Also

WIRE CONCRETE REIN-
FORCEMENT, WIRE
WORK of all kinds,
CORRUGATED WIRE
"LATHING"

1-Inch Space, No. 4 Wire

Send for Our No. 416 Catalogue.



Red, Brown, Buff and Black



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COLORS

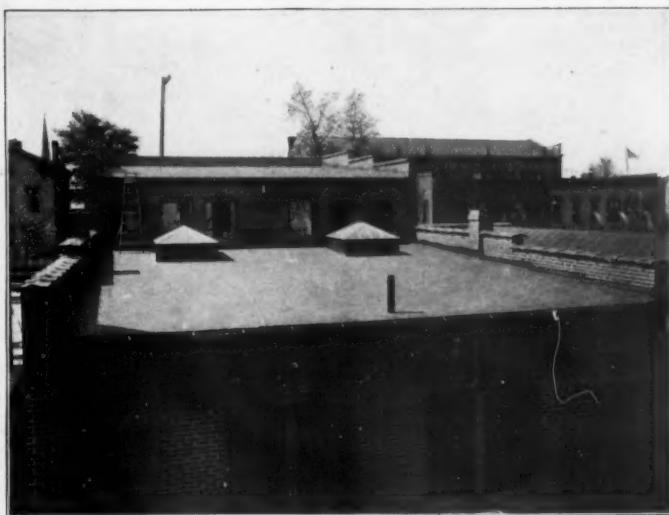
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Our Metallic Paints and Mortar Colors are unsurpassed in
strength, fineness, and body, durability, covering power and
permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO.

Chattanooga, Tennessee



Kellastone Roof, Ball Building, 626 Ohio Street, Terre Haute, Ind.

At Last—The World's Greatest Need A PERFECT ROOF

After many years of incessant investigation, of
tireless toil and exhaustive experiments, we have
AT LAST succeeded in producing a PERFECT ROOF

KELLASTONE

A monolithic roof with a crushing and tensile
strength far SUPERIOR to PORTLAND CEMENT
CONCRETE, absolutely FIRE PROOF and WATER
PROOF.

☐ A roof with no seams, no joints, no laps, no nails, no coal tar, no asphaltic compounds, no gravel, no water-proofing cements. A roof of unusual density, amazing elasticity, strong, tough and resilient, weighing only two pounds per square foot. Can be applied to any kind or form of structure as a plane surface, or if desired with shingle or tile effect.

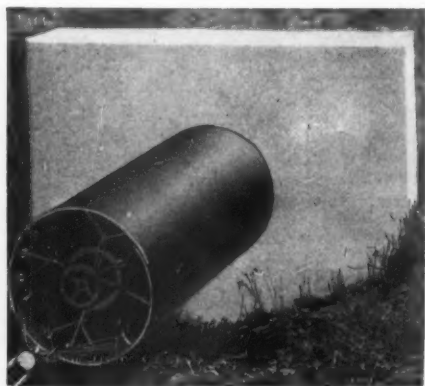
The modern roof—Elastic, Economical, Resilient, Durable, Absolutely Fire Proof and Water Proof.

A KELLASTONE ROOF WILL LAST A LIFETIME

U. S. KELLASTONE CO.

Home Office: Terre Haute, Ind.

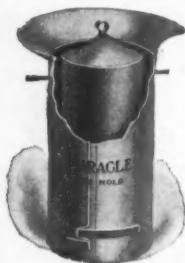
Tell 'em you saw it in ROCK PRODUCTS



TO OUR PATRONS, NEW and OLD

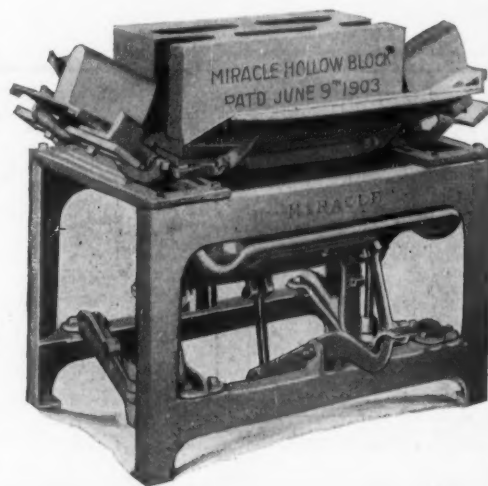
The addition of the famous **Miracle** interests to our own extensive line of concrete machinery, makes it possible for us to furnish you anything in the line of Mixers, Molds, Forms and Cement Workers' Hand Tools.

We are now the **Leading Manufacturers of Concrete Machinery in the United States.** You do not need to look elsewhere. We have it. All goods are sold on an absolute guarantee to be free from defects in workmanship and material.



We also have Waterproofing for Cement Blocks and Stucco work. We issue a general catalogue as well as special circulars. Write us for the information.

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ROCK PRODUCTS, 355 Dearborn Street, CHICAGO

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Concrete Blocks

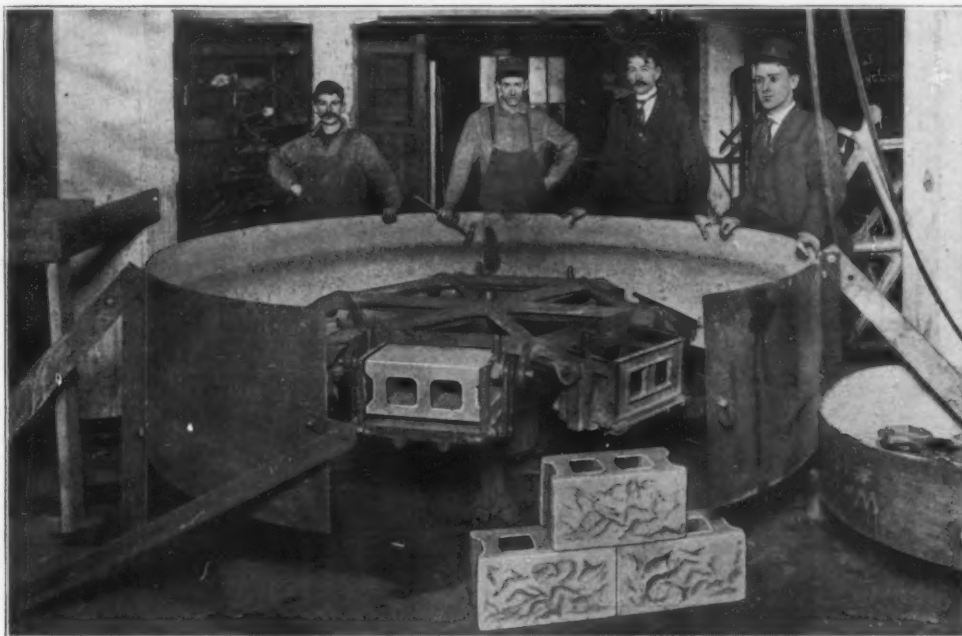
Highest Attainment of the
Concrete Industry

MADE BY CENTRIFUGAL FORCE

Strictly a High Class Factory Proposition
Speedy and Economical. The machine does all the work except the original mixing and piling up the finished product.

No Tamping. The mixture is poured into the moulds, then revolved rapidly, producing a pressure of thousands of pounds, uniformly, on every part of the block. The excess water is then extracted as a fine mist, and in about sixty seconds the blocks are ready to be removed from the moulds.

The Way it is Done. Take a West Slush Mixture of Portland Cement with any suitable aggregate and after a thorough mixing pour into the moulds successively until all are filled. Then throw the belt upon the service pulley for one minute or less at a high speed with the development of tremendous pressure in the fully perfected Centrifugal Machine. Remove the finished blocks from the molds and leave them on the pallets for a few hours. The blocks are then ready for storage in the yard or can be used in the wall within 12 hours. Fully protected by patents. Standard size machines in operation more than 2 years.



This machine makes 600 blocks in a 10-hour day, 8"x8"x16"

Centrifugal Concrete Machine Company

805 Corn Exchange Bank Bldg.
CHICAGO, ILL.

SAND LIME OR SILICATE BRICK



This plant located at South River, N. J., was formerly intended to operate under the "Division System" but is now being reconstructed to conform in every detail to the Wiebe-Hydro-Lime-Silicate-Process, and will be when completed the largest plant in the United States with a daily capacity of 100,000 brick.

SAND DRYER

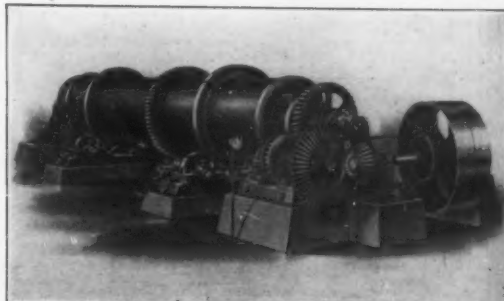
High efficiency and durability

RESUME
Dating as far back as 1901, when the manufacturing of commercial silicate brick was introduced into this country, no system has been more successful than the so called "Silo" or "Division" method. In the ratio that the Silo or Division Process is superior to all other systems hitherto employed, in that proportion the Wiebe-Hydro-Lime-Silicate process is superior to the Division method. All other processes are commercial impossibilities, and those who are operating under these old methods are losing money and producing an inferior quality of brick.

Will dry your sand perfectly and still deliver it at the discharge end at a very low temperature. At the point where the material contains the most moisture it strikes the hottest fire, and the moisture is immediately drawn away from the material being dried.

MANUFACTURED under the Wiebe Hydro-Lime-Silicate-Process, and by our specially designed machinery, have been acknowledged by leading engineers, architects and organizations of New York City to be the most perfect sand brick in the country. Compression as well as transverse strength, and its non-absorptive qualities far excel the requirements of the city.

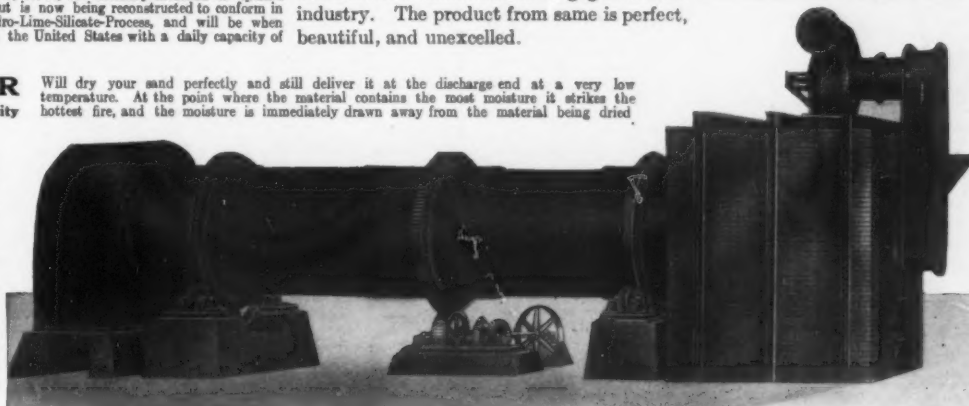
BY THE INTRODUCTION of our process and special machinery in this country, a large and profitable field is thrown open to the American manufacturer engaged in this industry. The product from same is perfect, beautiful, and unexcelled.



Hydro-Vapor Preparation Machine
Eliminates your doubts and worries. No sand-lime-brick plant is complete or successful without this machine. Receiving the material from the Silo, it prepares and delivers same in an absolutely perfect condition for the press.

Do you wish to know WHY our process is superior to all others? If you have any experience in the production of silicate brick, and will allow us to show you the merits of our process, you can easily understand why, and you will then readily appreciate the merits thereof. If you are interested we will gladly enter into any detail necessary to demonstrate the superiority of our system over all others.

Engineers, Designers, Builders of Factories for the Manufacture of High Grade Silicate Brick, Colored and Fancy Brick, Roofing and Wall Tile. Sole Owners of The Wiebe Hydro-Lime-Silicate-Process and Special Patented Machinery.

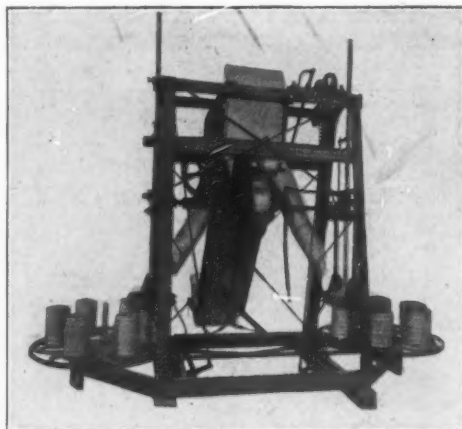


WIEBE ENGINEERING COMPANY

170 Broadway, NEW YORK

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THE McCracken Double Tile Machine



The McCracken Double Tile Machine makes all sizes of cement tile from 4 to 16 in. in diameter at the rate of from 10 to 20 tile per minute. Also makes building blocks or construction tile 8x8x16 at the rate of 2000 to 3000 per ten hour day.

The machine will make two different sizes of tile at the same time or building blocks and tile at the same time, or either end of machine can be used without using the other.

The machine has no cams and runs just as smooth at high speed as when running slow. Takes less labor per 1000 tile than any other machine.

Tile are packed so hard that the large sizes can be carried without the use of pallets. Machine is very simple and strong and runs very light, and elevator can be started and stopped without stopping the machine.

See the McCracken Machine before you buy. Write to

The Sioux City Cement Machinery Company
219 4th Street, SIOUX CITY, IOWA

The Chase Roller Bearing Car FOR CEMENT, BLOCK AND TILE



**BOTTOM AND SIDE DUMP CARS, TRANSFER
CARS, TURNABLES, SWITCHES, ETC.**

You cannot afford to overlook the necessity of handling your material and product as economically as your competitor. Our goods will help you do this.

WRITE US FOR CATALOG AND PRICES

Chase Foundry Manufacturing Co.
COLUMBUS, OHIO

The Improved Peerless One Man Cement Brick Machine

Equipped with new tamping device, which tamps ten bricks in the machine at one operation, making 12,000 perfectly formed bricks in ten hours.



The superiority of the Peerless Brick Machine was demonstrated conclusively at all of the recent conventions.

It is the greatest invention in the industry. Simple, strong and durable. Combines all the advantages of every other machine at the smallest cost.

The most successful and most easily operated one-man brick machine ever made.

Write at once for particulars.

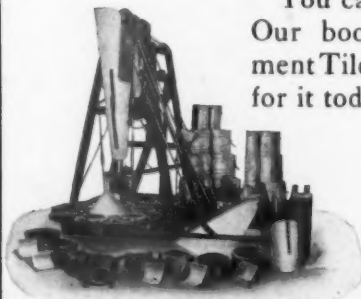
Peerless Brick Machine Co.
MINNEAPOLIS, MINN.

\$5,000.00 Profit the First Year

With an investment of Five Thousand Dollars and doing a \$15,000.00 business a little factory in Western Iowa at the end of the first year shows a net profit of \$5,000.00.

Just think of it! 33 1/3 per cent profit on the total amount of the business and 100 per cent profit on the investment.

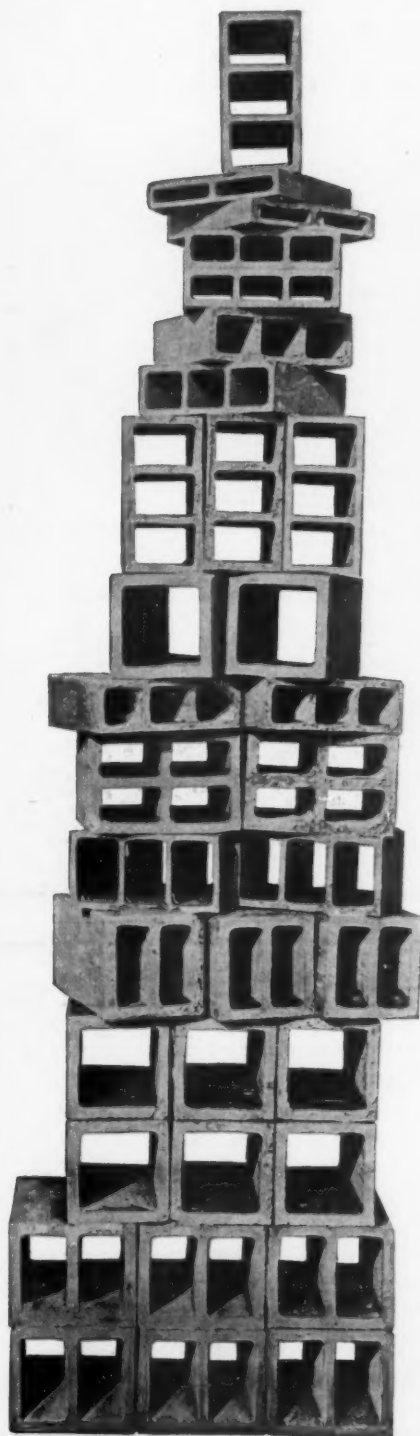
You can do equally as well. Our booklet "Money in Cement Tile" tells you how. Write for it today—it's free.



**THE
CEMENT TILE
MACHINERY CO.**

"Manufacturers of the Schenk
Cement Drain Tile Machine"
Rath St., Waterloo, Iowa.

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Our 1910 Catalog

Gives the method of manufacture, fire and compression test data, and the endorsements of local architects and other building authorities. Also many other articles and illustrations of interest to the general public. May we send you, postpaid, a copy of our Catalog?

The Concrete Stone & Sand Co.
Youngstown, Ohio.



Has The First *Pauly* Concrete Tile Plant Been Successful?

This question, which is usually first asked us by interested parties, is best answered by two facts:—1. During the year of 1909, the demand in Youngstown, Ohio, could not be satisfied, and (2) the plants capacity output is sold until the middle of the summer of 1910, in the **City of Youngstown alone**. In this connection it might be stated also that 4 tiles of our most common size, 8x8x16, can be manufactured from one cubic foot of concrete, with a labor cost of 50 per cent of the cost of concrete anywhere east of the Mississippi.

A weatherproof home of fireproof material can now be built for almost wooden construction cost. These points have been clearly demonstrated in Youngstown by practical use of *Pauly* Concrete Structural and Fireproofing Tile, in a variety of buildings. The result gained has not only been a financial success, but also an enviable position in the estimation of the entire building public.

Persons interested in this practical and profitable phase of the concrete business, are always welcome by the The Concrete Stone & Sand Co., Youngstown, Ohio, where they will be shown every detail of the initial factory.



Tell 'em you saw it in ROCK PRODUCTS

If You're Going Into the Concrete Block Business

IT WILL PAY YOU TO READ THIS LETTER CAREFULLY.

This letter is merely a sample of what we are receiving daily.

READ IT PROFIT BY IT IT MEANS MONEY TO YOU!

"CENTURY CEMENT MACHINE CO., Rochester, N. Y.

Gentlemen:—Kindly quote price on ONE Hercules Regular block machine and parts for making FOUR rock face stone 8 x 8 x 16 at ONE TIME, also FOUR Plain face with parts for making fractionals and corner blocks.

We are using a _____ machine 8 x 8 x 16 at present, but a large contract makes it necessary to increase our capacity at once."

This firm has learned from experience that ONE HERCULES BLOCK MACHINE can be equipped so as to equal FOUR machines such as they are using.

WHAT'S THE COST?

Four Machines (Other Make) equipped as above	
at \$125.00 each.....	\$500.00
One Hercules equipped as above.....	\$176.50

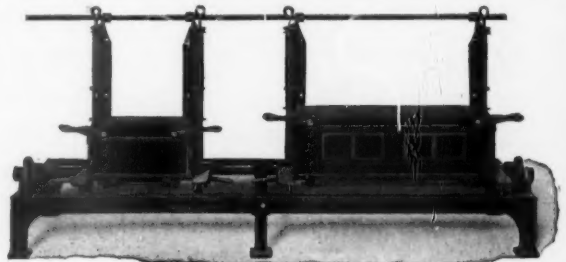
Figure the saving for yourself, not only the first saving in cost of machine, but the far greater saving in cost of operation. You have one machine to operate instead of four. This means an enormous saving in labor, less space is required. You can produce blocks using a coarse wet aggregate, making a saving in cement and at the same time producing a stronger and better grade of concrete block. You can from time to time add parts for the making of other sizes because Hercules machines are unlimited as to production.

One Hercules Machine is all you'll need

Think it over—Investigate—Then, Write us.

CENTURY CEMENT MACHINE CO.

288-292 St. Paul St., Rochester, N. Y.



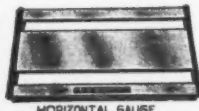
Tools For Spreading Mortar and Laying Cement Blocks

Enable a man to do the best possible work in the shortest possible time with the least possible expense.

THE TIME AND MATERIAL SAVED IN ONE WEEK WILL PAY FOR THE TOOLS.

Write for descriptive circular.

Ormsby Mortar Gauge Co.
327 Church Street, Xenia, Ohio



Perfection at Last Attained in the Concrete Block Industry

The Perfection Power Block Machine is the only Power Block Machine on the market, making a Hollow Concrete Building Block under Heavy Pressure and at Great Speed.

Machines have been in constant use since July 1st, 1905, with practically no expense for repairs.

The machine handles sand, gravel, crushed rock, slag and coloring materials perfectly.

All materials accurately measured, thoroughly mixed and uniformly pressed under 200,000 pounds pressure.

Makes 8, 9 and 12x8x24 inch blocks in five faces, and fractional and angle blocks. Machine can be arranged to make Two Piece and Faced blocks, if desired.

All machines delivered set up and put in operation to show a guaranteed capacity of 60 blocks (12x8x24 inch) per hour with five men.

Blocks perfectly cured in 24 hours in Vapor Curing Kilns of our own design. Full details, catalog, testimonials, etc., sent upon request.

THE PERFECTION BLOCK MACHINE CO.
SIOUX FALLS, SOUTH DAKOTA.

PERFECTION IN BLOCK MAKING

If you wish to attain this you should combine these three important features:

Wet Process, Face Down, Damp Curing.

The PETTYJOHN INVINCIBLE Machine does this, and is the only machine that does. Tandem Invincible makes two blocks at once. Price \$65.00 and up. Single Invincible, \$35.00 and up. With our Triple Tier Racking System green blocks can be stacked three high direct from machine with inexpensive home-made rigging. Plans and blue prints free to customers. It economizes space, reduces off-bearing distance and above all insures slow, even, damp and perfect curing and bleaching.

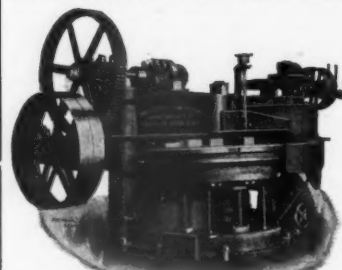
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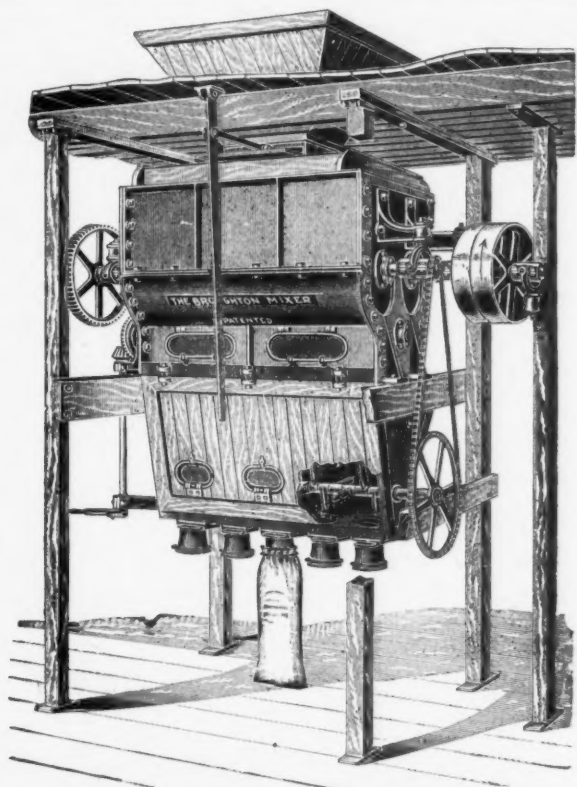
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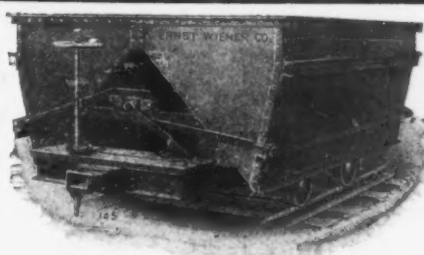
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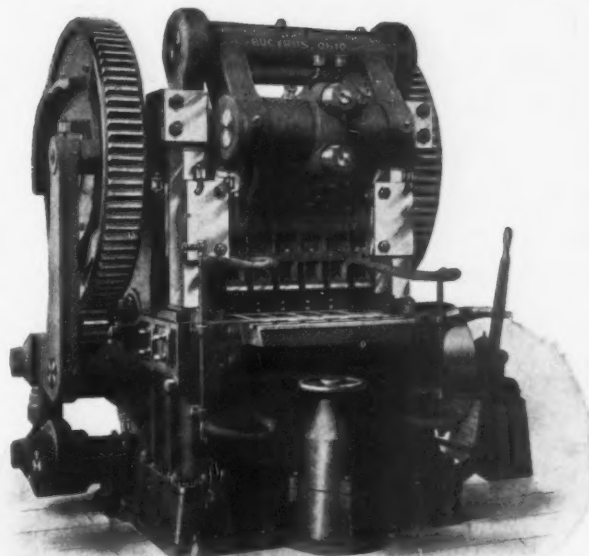
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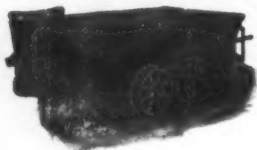
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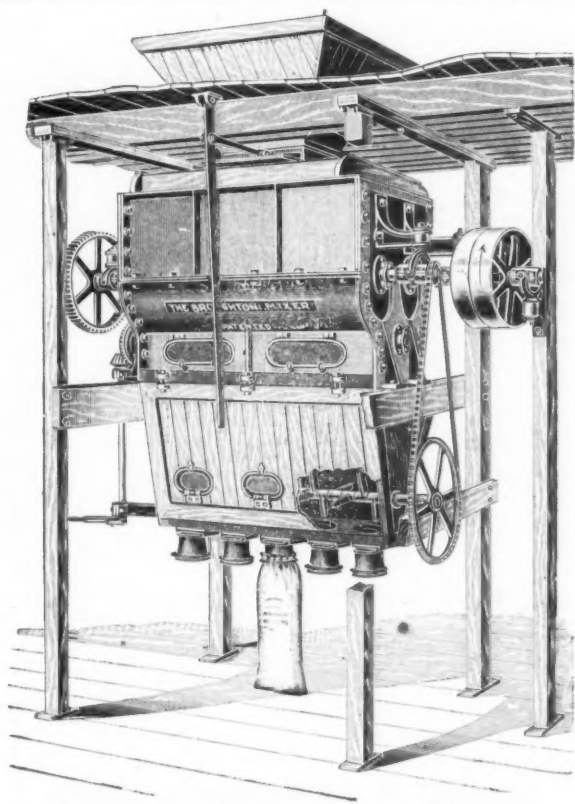
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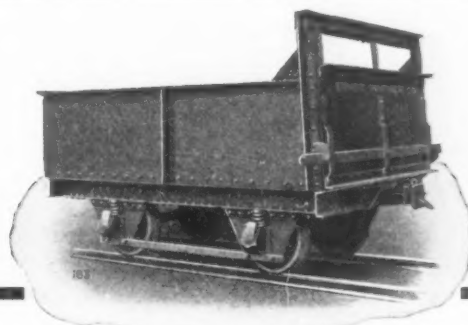
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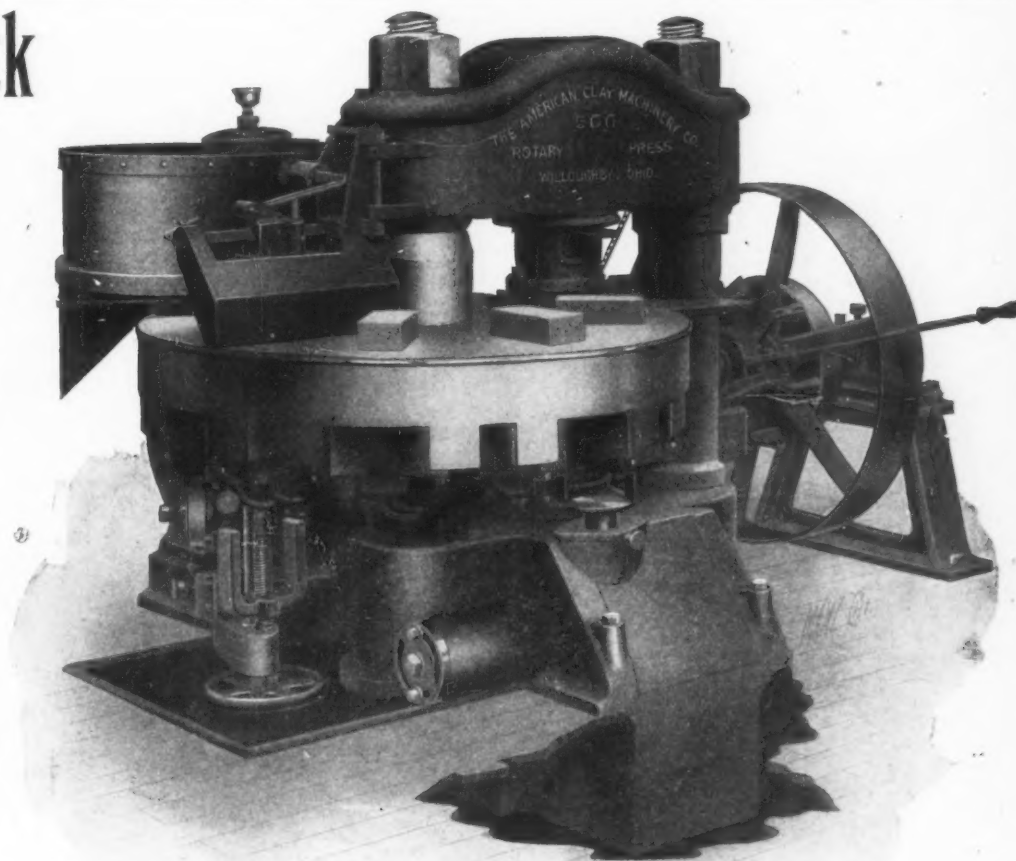
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